Mathematica 11.3 Integration Test Results

Test results for the 3071 problems in "1.1.3.2 (c x)^m (a+b x^n)^p.m"

Problem 240: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a+b x^3\right)^3 \, dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^3\right)^4}{12 b}$$

Result (type 1, 43 leaves):

$$\frac{a^3 x^3}{3}+\frac{1}{2} a^2 b x^6+\frac{1}{3} a b^2 x^9+\frac{b^3 x^{12}}{12}$$

Problem 245: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^3}{x^{13}} \, dx$$

Optimal (type 1, 19 leaves, 1 step):

$$-\frac{\left(a+b x^3\right)^4}{12 a x^{12}}$$

Result (type 1, 43 leaves):

$$-\frac{a^3}{12 x^{12}}-\frac{a^2 b}{3 x^9}-\frac{a b^2}{2 x^6}-\frac{b^3}{3 x^3}$$

Problem 262: Result more than twice size of optimal antiderivative.

$$\int x^5 \left(a+b x^3\right)^5 \, dx$$

Optimal (type 1, 34 leaves, 3 steps):

$$-\frac{a \left(a+b x^3\right)^6}{18 b^2}+\frac{\left(a+b x^3\right)^7}{21 b^2}$$

Result (type 1, 69 leaves):

$$\frac{a^5 x^6}{6}+\frac{5}{9} a^4 b x^9+\frac{5}{6} a^3 b^2 x^{12}+\frac{2}{3} a^2 b^3 x^{15}+\frac{5}{18} a b^4 x^{18}+\frac{b^5 x^{21}}{21}$$

Problem 263: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a+b x^3\right)^5 dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^3\right)^6}{18 b}$$

Result (type 1, 69 leaves):

$$\frac{a^5 x^3}{3}+\frac{5}{6} a^4 b x^6+\frac{10}{9} a^3 b^2 x^9+\frac{5}{6} a^2 b^3 x^{12}+\frac{1}{3} a b^4 x^{15}+\frac{b^5 x^{18}}{18}$$

Problem 270: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^5}{x^{19}} dx$$

Optimal (type 1, 19 leaves, 1 step):

$$-\frac{\left(a+b x^3\right)^6}{18 a x^{18}}$$

Result (type 1, 69 leaves):

$$-\frac{a^5}{18 x^{18}}-\frac{a^4 b}{3 x^{15}}-\frac{5 a^3 b^2}{6 x^{12}}-\frac{10 a^2 b^3}{9 x^9}-\frac{5 a b^4}{6 x^6}-\frac{b^5}{3 x^3}$$

Problem 289: Result more than twice size of optimal antiderivative.

$$\int x^8 \left(a+b x^3\right)^8 dx$$

Optimal (type 1, 53 leaves, 3 steps):

$$\frac{a^2 \left(a+b x^3\right)^9}{27 b^3}-\frac{a \left(a+b x^3\right)^{10}}{15 b^3}+\frac{\left(a+b x^3\right)^{11}}{33 b^3}$$

Result (type 1, 108 leaves):

$$\frac{a^8 x^9}{9}+\frac{2}{3} a^7 b x^{12}+\frac{28}{15} a^6 b^2 x^{15}+\frac{28}{9} a^5 b^3 x^{18}+$$
$$\frac{10}{3} a^4 b^4 x^{21}+\frac{7}{3} a^3 b^5 x^{24}+\frac{28}{27} a^2 b^6 x^{27}+\frac{4}{15} a b^7 x^{30}+\frac{b^8 x^{33}}{33}$$

Problem 290: Result more than twice size of optimal antiderivative.

$$\int x^5 \left(a+b x^3\right)^8 dx$$

Optimal (type 1, 34 leaves, 3 steps):

$$-\frac{a\left(a+b x^3\right)^9}{27 b^2}+\frac{\left(a+b x^3\right)^{10}}{30 b^2}$$

Result (type 1, 108 leaves):

$$\frac{a^8 x^6}{6}+\frac{8}{9} a^7 b x^9+\frac{7}{3} a^6 b^2 x^{12}+\frac{56}{15} a^5 b^3 x^{15}+\frac{35}{9} a^4 b^4 x^{18}+\frac{8}{3} a^3 b^5 x^{21}+\frac{7}{6} a^2 b^6 x^{24}+\frac{8}{27} a b^7 x^{27}+\frac{b^8 x^{30}}{30}$$

Problem 291: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a+b x^3\right)^8 \, dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^3\right)^9}{27 b}$$

Result (type 1, 108 leaves):

$$\frac{a^8 x^3}{3}+\frac{4}{3} a^7 b x^6+\frac{28}{9} a^6 b^2 x^9+\frac{14}{3} a^5 b^3 x^{12}+\frac{14}{3} a^4 b^4 x^{15}+\frac{28}{9} a^3 b^5 x^{18}+\frac{4}{3} a^2 b^6 x^{21}+\frac{1}{3} a b^7 x^{24}+\frac{b^8 x^{27}}{27}$$

Problem 301: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^8}{x^{28}} \, dx$$

Optimal (type 1, 19 leaves, 1 step):

$$-\frac{\left(a+b x^3\right)^9}{27 a x^{27}}$$

Result (type 1, 108 leaves):

$$-\frac{a^8}{27 x^{27}}-\frac{a^7 b}{3 x^{24}}-\frac{4 a^6 b^2}{3 x^{21}}-\frac{28 a^5 b^3}{9 x^{18}}-\frac{14 a^4 b^4}{3 x^{15}}-\frac{14 a^3 b^5}{3 x^{12}}-\frac{28 a^2 b^6}{9 x^9}-\frac{4 a b^7}{3 x^6}-\frac{b^8}{3 x^3}$$

Problem 302: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^8}{x^{31}} \, dx$$

Optimal (type 1, 40 leaves, 3 steps):

$$-\frac{\left(a+b x^3\right)^9}{30 a x^{30}}+\frac{b\left(a+b x^3\right)^9}{270 a^2 x^{27}}$$

Result (type 1, 108 leaves):

$$-\frac{a^8}{30 x^{30}}-\frac{8 a^7 b}{27 x^{27}}-\frac{7 a^6 b^2}{6 x^{24}}-\frac{8 a^5 b^3}{3 x^{21}}-\frac{35 a^4 b^4}{9 x^{18}}-\frac{56 a^3 b^5}{15 x^{15}}-\frac{7 a^2 b^6}{3 x^{12}}-\frac{8 a b^7}{9 x^9}-\frac{b^8}{6 x^6}$$

Problem 364: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 124 leaves):

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

Problem 366: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 138 leaves, 6 steps):

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

Result (type 3, 124 leaves):

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

Problem 376: Result unnecessarily involves imaginary or complex numbers.

$$\int x^6\,\sqrt{a+b\,x^3}\,dx$$

Optimal (type 4, 275 leaves, 4 steps):

$$-\frac{48 a^2 x \sqrt{a+b x^3}}{935 b^2}+\frac{6 a x^4 \sqrt{a+b x^3}}{187 b}+\frac{2}{17} x^7 \sqrt{a+b x^3}+\left(32\times 3^{3/4} \sqrt{2+\sqrt{3}}\; a^3 \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(935 b^{7/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 184 leaves):

$$\sqrt{a+b x^3} \left(-\frac{48 a^2 x}{935 b^2}+\frac{6 a x^4}{187 b}+\frac{2 x^7}{17}\right)+\left(32\, i\, 3^{3/4} a^{10/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left(935 (-b)^{1/3} b^2 \sqrt{a+b x^3}\right)$$

Problem 377: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 251 leaves, 3 steps):

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

Result (type 4, 168 leaves) :

$$\frac{2 x \sqrt{a+b x^3}\, \left(3 a+5 b x^3\right)}{55 b}+\left(4 \,\mathrm{i}\, 3^{3/4} a^{7/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left(55 (-b)^{4/3} \sqrt{a+b x^3}\right)$$

Problem 378: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 227 leaves, 2 steps) :

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

Result (type 4, 155 leaves) :

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

Problem 379: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 228 leaves, 2 steps):

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

Result (type 4, 158 leaves):

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

Problem 380: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^3}}{x^6}\, dx$$

Optimal (type 4, 253 leaves, 3 steps):

$$-\frac{\sqrt{a+b x^3}}{5 x^5}-\frac{3 b \sqrt{a+b x^3}}{20 a x^2}-\left(3^{3/4} \sqrt{2+\sqrt{3}}\, b^{5/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Bigg/ \left(20 a \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 173 leaves):

$$\left(-\frac{1}{5 x^5}-\frac{3 b}{20 a x^2}\right) \sqrt{a+b x^3}-\left(i\, 3^{3/4} b^2 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right) \Big/ \left(20 a^{2/3} (-b)^{1/3} \sqrt{a+b x^3}\right)$$

Problem 381: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^3}}{x^9} \, dx$$

Optimal (type 4, 277 leaves, 4 steps):

$$-\frac{\sqrt{a+b x^3}}{8 x^8}-\frac{3 b \sqrt{a+b x^3}}{80 a x^5}+\frac{21 b^2 \sqrt{a+b x^3}}{320 a^2 x^2}+$$

$$\left(7\times 3^{3/4} \sqrt{2+\sqrt{3}}\, b^{8/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$

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

$$\left(320 a^2 \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 181 leaves):

$$\left(-40 a^3-52 a^2 b x^3+9 a b^2 x^6+21 b^3 x^9-\right.$$

$$7\, i\, 3^{3/4} a^{1/3} (-b)^{8/3} x^8 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right) \Big/ \left(320 a^2 x^8 \sqrt{a+b x^3}\right)$$

Problem 382: Result unnecessarily involves imaginary or complex numbers.

$$\int x^7 \sqrt{a+b x^3}\, dx$$

Optimal (type 4, 535 leaves, 6 steps):

$$-\frac{60 a^2 x^2 \sqrt{a+b x^3}}{1729 b^2}+\frac{6 a x^5 \sqrt{a+b x^3}}{247 b}+\frac{2}{19} x^8 \sqrt{a+b x^3}+\frac{240 a^3 \sqrt{a+b x^3}}{1729 b^{8/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}-\left(120\times 3^{1/4} \sqrt{2-\sqrt{3}}\, a^{10/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(1729 b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)+\left(80 \sqrt{2}\, 3^{3/4} a^{10/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(1729 b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 238 leaves):

$$-\left(\left(2\left((-b)^{2/3}\left(a+b x^3\right)\left(30 a^2 x^2-21 a b x^5-91 b^2 x^8\right)+\right.\right.\right.$$
$$40(-1)^{2/3} 3^{3/4} a^{11/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)}\sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}$$
$$\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i(-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\right.$$
$$\left.\left.\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i(-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\right)\Big/\left(1729(-b)^{8/3}\sqrt{a+b x^3}\right)\right)$$

Problem 383: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\sqrt{a+b x^3}\,dx$$

Optimal (type 4, 511 leaves, 5 steps):

$$\frac{6\,a\,x^2\sqrt{a+b\,x^3}}{91\,b}+\frac{2}{13}x^5\sqrt{a+b\,x^3}-\frac{24\,a^2\sqrt{a+b\,x^3}}{91\,b^{5/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)}+$$
$$\left(12\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{7/3}\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}\right],\,-7-4\sqrt{3}\right]\right)\bigg/$$
$$\left(91\,b^{5/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\sqrt{a+b\,x^3}\right)-\left(8\sqrt{2}\;3^{3/4}\,a^{7/3}\left(a^{1/3}+b^{1/3}\,x\right)\right.$$
$$\left.\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}\right],\,-7-4\sqrt{3}\right]\right)\bigg/$$
$$\left(91\,b^{5/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\sqrt{a+b\,x^3}\right)$$

Result (type 4, 231 leaves):

$$\frac{2\sqrt{a+b\,x^3}\left(3\,a\,x^2+7\,b\,x^5\right)}{91\,b}+$$
$$\left(8\left(-1\right)^{1/6}3^{3/4}\,a^{8/3}\sqrt{\left(-1\right)^{5/6}\left(-1+\frac{\left(-b\right)^{1/3}x}{a^{1/3}}\right)}\sqrt{1+\frac{\left(-b\right)^{1/3}x}{a^{1/3}}+\frac{\left(-b\right)^{2/3}x^2}{a^{2/3}}}\right.$$
$$\left(-i\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}-\frac{i\left(-b\right)^{1/3}x}{a^{1/3}}}}{3^{1/4}}\right],\,\left(-1\right)^{1/3}\right]+\right.$$
$$\left.\left.\left(-1\right)^{1/3}\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}-\frac{i\left(-b\right)^{1/3}x}{a^{1/3}}}}{3^{1/4}}\right],\,\left(-1\right)^{1/3}\right]\right)\right)\bigg/\left(91\left(-b\right)^{5/3}\sqrt{a+b\,x^3}\right)$$

Problem 384: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 487 leaves, 4 steps):

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

Result (type 4, 218 leaves):

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

Problem 385: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^3}}{x^2}\, dx$$

Optimal (type 4, 479 leaves, 4 steps):

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

Result (type 4, 214 leaves):

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

Problem 386: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 511 leaves, 5 steps):

$$-\frac{\sqrt{a+b x^3}}{4 x^4}-\frac{3 b \sqrt{a+b x^3}}{8 a x}+\frac{3 b^{4/3} \sqrt{a+b x^3}}{8 a \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}-$$

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

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

$$\left(16 a^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)+\left(3^{3/4} b^{4/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$

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

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

Result (type 4, 231 leaves):

$$-\frac{\sqrt{a+b x^3} \left(2 a+3 b x^3\right)}{8 a x^4}+\frac{1}{8 a^{1/3} \sqrt{a+b x^3}}(-1)^{1/6} 3^{3/4} (-b)^{4/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)}$$

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

$$\left.(-1)^{1/3}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 394: Result unnecessarily involves imaginary or complex numbers.

$$\int x^6 \left(a+b x^3\right)^{3/2} dx$$

Optimal (type 4, 296 leaves, 5 steps):

$$-\frac{432\,a^3\,x\,\sqrt{a+b\,x^3}}{21\,505\,b^2}+\frac{54\,a^2\,x^4\,\sqrt{a+b\,x^3}}{4301\,b}+\frac{18}{391}\,a\,x^7\,\sqrt{a+b\,x^3}+\frac{2}{23}\,x^7\,\left(a+b\,x^3\right)^{3/2}+\left(288\times 3^{3/4}\,\sqrt{2+\sqrt{3}}\;a^4\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(21\,505\,b^{7/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\;\sqrt{a+b\,x^3}\right)$$

Result (type 4, 195 leaves):

$$\sqrt{a+b\,x^3}\,\left(-\frac{432\,a^3\,x}{21\,505\,b^2}+\frac{54\,a^2\,x^4}{4301\,b}+\frac{52\,a\,x^7}{391}+\frac{2\,b\,x^{10}}{23}\right)+\left(288\,i\,3^{3/4}\,a^{13/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\;\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left(21\,505\,(-b)^{1/3}\,b^2\,\sqrt{a+b\,x^3}\right)$$

Problem 395: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 272 leaves, 4 steps):

$$\frac{54 a^2 x \sqrt{a+b x^3}}{935 b}+\frac{18}{187} a x^4 \sqrt{a+b x^3}+\frac{2}{17} x^4 \left(a+b x^3\right)^{3/2}-$$
$$\left(36\times 3^{3/4} \sqrt{2+\sqrt{3}}\, a^3 \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(935 b^{4/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 178 leaves):

$$-\left(\left(2\left((-b)^{1/3} \left(a+b x^3\right) \left(27 a^2 x+100 a b x^4+55 b^2 x^7\right)-\right.\right.\right.$$
$$18\, \mathrm{i}\, 3^{3/4} a^{10/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}$$
$$\left.\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i} (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(935 (-b)^{4/3} \sqrt{a+b x^3}\right)\right)$$

Problem 396: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 246 leaves, 3 steps):

$$\frac{18}{55} a x \sqrt{a+b x^3}+\frac{2}{11} x \left(a+b x^3\right)^{3/2}+\left(18\times 3^{3/4} \sqrt{2+\sqrt{3}}\, a^2 \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(55 b^{1/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 166 leaves):

$$\sqrt{a+b x^3} \left(\frac{28 a x}{55}+\frac{2 b x^4}{11}\right)+\left(18 \,\mathrm{i}\, 3^{3/4} a^{7/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left(55 (-b)^{1/3} \sqrt{a+b x^3}\right)$$

Problem 397: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 246 leaves, 3 steps):

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

Result (type 4, 167 leaves):

$$\left(-\frac{a}{2 x^2}+\frac{2 b x}{5}\right) \sqrt{a+b x^3}+\left(9 i 3^{3/4} a^{4/3} b \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right) \Big/ \left(10 (-b)^{1/3} \sqrt{a+b x^3}\right)$$

Problem 398: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^3\right)^{3/2}}{x^6} \, dx$$

Optimal (type 4, 247 leaves, 3 steps):

$$-\frac{9 b \sqrt{a+b x^3}}{20 x^2}-\frac{\left(a+b x^3\right)^{3/2}}{5 x^5}+$$
$$\left(9 \times 3^{3/4} \sqrt{2+\sqrt{3}}\; b^{5/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\; \text{EllipticF}\left[\right.\right.$$
$$\left.\left.\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Big/ \left(20 \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 167 leaves):

$$-\frac{\sqrt{a+b x^3} \left(4 a+13 b x^3\right)}{20 x^5}+\frac{1}{20 \sqrt{a+b x^3}} 9 i 3^{3/4} a^{1/3} (-b)^{5/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)}$$
$$\sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]$$

Problem 399: Result unnecessarily involves imaginary or complex numbers.

$$\int x^7 \left(a+b x^3\right)^{3/2} \, dx$$

Optimal (type 4, 556 leaves, 7 steps):

$$-\frac{108 a^3 x^2 \sqrt{a+b x^3}}{8645 b^2}+\frac{54 a^2 x^5 \sqrt{a+b x^3}}{6175 b}+\frac{18}{475} a x^8 \sqrt{a+b x^3}+\frac{432 a^4 \sqrt{a+b x^3}}{8645 b^{8/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}+\frac{2}{25} x^8 \left(a+b x^3\right)^{3/2}-\left(216\times 3^{1/4} \sqrt{2-\sqrt{3}}\, a^{13/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(8645 b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)+\left(144 \sqrt{2}\, 3^{3/4} a^{13/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(8645 b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 253 leaves):

$$\frac{2 x^2 \sqrt{a+b x^3} \left(-270 a^3+189 a^2 b x^3+2548 a b^2 x^6+1729 b^3 x^9\right)}{43225 b^2}+\left(144 (-1)^{1/6} 3^{3/4} a^{14/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}} \left(-i \sqrt{3}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{1/3} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(8645 (-b)^{8/3} \sqrt{a+b x^3}\right)$$

Problem 400: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 532 leaves, 6 steps):

$$\frac{54\,a^2\,x^2\,\sqrt{a+b\,x^3}}{1729\,b}+\frac{18}{247}\,a\,x^5\,\sqrt{a+b\,x^3}-\frac{216\,a^3\,\sqrt{a+b\,x^3}}{1729\,b^{5/3}\,\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)}+\frac{2}{19}\,x^5\,\left(a+b\,x^3\right)^{3/2}+\left(108\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,a^{10/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}\right],-7-4\,\sqrt{3}\right]\right)\Bigg/\left(1729\,b^{5/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\sqrt{a+b\,x^3}\right)-\left(72\,\sqrt{2}\,3^{3/4}\,a^{10/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}\right],-7-4\,\sqrt{3}\right]\right)\Bigg/\left(1729\,b^{5/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 238 leaves):

$$-\left(\left(2\left((-b)^{2/3}\,\left(a+b\,x^3\right)\,\left(27\,a^2\,x^2+154\,a\,b\,x^5+91\,b^2\,x^8\right)+36\,(-1)^{2/3}\,3^{3/4}\,a^{11/3}\,\sqrt{(-1)^{5/6}\,\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\right)\Bigg/\left(1729\,(-b)^{5/3}\,\sqrt{a+b\,x^3}\right)\right)$$

Problem 401: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 508 leaves, 5 steps):

$$\frac{18}{91} a x^2 \sqrt{a+b x^3} + \frac{54 a^2 \sqrt{a+b x^3}}{91 b^{2/3} \left(\left(1+\sqrt{3}\right) a^{1/3} + b^{1/3} x\right)} + \frac{2}{13} x^2 \left(a+b x^3\right)^{3/2} - \left(27 \times 3^{1/4} \sqrt{2-\sqrt{3}}\ a^{7/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right], -7-4\sqrt{3}\right]\right) \Big/ \left(91 b^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right) + \left(18 \sqrt{2}\ 3^{3/4} a^{7/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right], -7-4\sqrt{3}\right]\right) \Big/ \left(91 b^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 229 leaves):

$$\sqrt{a+b x^3}\left(\frac{32 a x^2}{91}+\frac{2 b x^5}{13}\right)+$$

$$\left(18 (-1)^{1/6} 3^{3/4} a^{8/3} \sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$

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

$$\left.\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(91 (-b)^{2/3} \sqrt{a+b x^3}\right)$$

Problem 402: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 504 leaves, 5 steps) :

$$\frac{9}{7} b x^2 \sqrt{a+b x^3} + \frac{27 a b^{1/3} \sqrt{a+b x^3}}{7 \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)} - \frac{\left(a+b x^3\right)^{3/2}}{x} -$$

$$\left(27 \times 3^{1/4} \sqrt{2-\sqrt{3}}\ a^{4/3} b^{1/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$

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

$$\left(14 \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right) + \left(9 \sqrt{2}\ 3^{3/4} a^{4/3} b^{1/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$

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

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

Result (type 4, 228 leaves):

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

$$\left(9 (-1)^{1/6} 3^{3/4} a^{5/3} b \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$

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

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

Problem 403: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^3\right)^{3/2}}{x^5} \, dx$$

Optimal (type 4, 505 leaves, 5 steps):

$$-\frac{9 b \sqrt{a+b x^3}}{8 x}+\frac{27 b^{4/3} \sqrt{a+b x^3}}{8 \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}-\frac{\left(a+b x^3\right)^{3/2}}{4 x^4}-$$
$$\left(27 \times 3^{1/4} \sqrt{2-\sqrt{3}}\, a^{1/3} b^{4/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Big/$$
$$\left(16 \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)+\left(9 \times 3^{3/4} a^{1/3} b^{4/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$
$$\left.\sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Big/$$
$$\left(4 \sqrt{2} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 228 leaves):

$$-\frac{\sqrt{a+b x^3} \left(2 a+11 b x^3\right)}{8 x^4}+\frac{1}{8 \sqrt{a+b x^3}} 9 (-1)^{1/6} 3^{3/4} a^{2/3} (-b)^{4/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)}$$
$$\sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}} \left(-i \sqrt{3}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$
$$\left.(-1)^{1/3}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 411: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a+b\,x^3}}\,dx$$

Optimal (type 4, 254 leaves, 3 steps):

$$-\frac{16\,a\,x\,\sqrt{a+b\,x^3}}{55\,b^2}+\frac{2\,x^4\,\sqrt{a+b\,x^3}}{11\,b}+\left(32\,\sqrt{2+\sqrt{3}}\,a^2\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\right]\right)\Big/\left(55\times 3^{1/4}\,b^{7/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 174 leaves):

$$\sqrt{a+b\,x^3}\,\left(-\frac{16\,a\,x}{55\,b^2}+\frac{2\,x^4}{11\,b}\right)+\left(32\,i\,a^{7/3}\,\sqrt{(-1)^{5/6}\,\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(55\times 3^{1/4}\,(-b)^{1/3}\,b^2\,\sqrt{a+b\,x^3}\right)$$

Problem 412: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 230 leaves, 2 steps):

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

Result (type 4, 158 leaves) :

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

Problem 413: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a+b x^3}}\, dx$$

Optimal (type 4, 207 leaves, 1 step) :

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

Result (type 4, 136 leaves) :

$$\left(2\,i\,a^{1/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}x}{a^{1/3}}\right)}\sqrt{1+\frac{(-b)^{1/3}x}{a^{1/3}}+\frac{(-b)^{2/3}x^2}{a^{2/3}}}\right.$$

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

Problem 414: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^3\sqrt{a+b x^3}}\,dx$$

Optimal (type 4, 234 leaves, 2 steps):

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

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

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

Result (type 4, 161 leaves):

$$-\frac{\sqrt{a+b x^3}}{2 a x^2}-\left(i\,b\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}x}{a^{1/3}}\right)}\sqrt{1+\frac{(-b)^{1/3}x}{a^{1/3}}+\frac{(-b)^{2/3}x^2}{a^{2/3}}}\right.$$

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

Problem 415: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^6\sqrt{a+b x^3}}\,dx$$

Optimal (type 4, 256 leaves, 3 steps):

$$-\frac{\sqrt{a+b x^3}}{5 a x^5}+\frac{7 b \sqrt{a+b x^3}}{20 a^2 x^2}+\left(7 \sqrt{2+\sqrt{3}}\ b^{5/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(20\times 3^{1/4} a^2 \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 170 leaves):

$$\frac{1}{60 a^2 x^5 \sqrt{a+b x^3}}\left(-12 a^2+9 a b x^3+21 b^2 x^6+7 i\, 3^{3/4} a^{1/3} (-b)^{5/3} x^5 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 416: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\sqrt{a+b x^3}}\,dx$$

Optimal (type 4, 514 leaves, 5 steps):

$$-\frac{20\,a\,x^2\sqrt{a+b\,x^3}}{91\,b^2}+\frac{2\,x^5\sqrt{a+b\,x^3}}{13\,b}+\frac{80\,a^2\sqrt{a+b\,x^3}}{91\,b^{8/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)}-$$

$$\left(40\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{7/3}\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\right.$$

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

$$\left(91\,b^{8/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\;\sqrt{a+b\,x^3}\right)+\left(80\sqrt{2}\;a^{7/3}\left(a^{1/3}+b^{1/3}\,x\right)\right.$$

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

$$\left(91\times 3^{1/4}\,b^{8/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\;\sqrt{a+b\,x^3}\right)$$

Result (type 4, 228 leaves) :

$$-\left(\left(2\left(3\left(-b\right)^{2/3}\left(a+b\,x^3\right)\left(10\,a\,x^2-7\,b\,x^5\right)+\right.\right.\right.$$

$$40\left(-1\right)^{2/3}3^{3/4}\,a^{8/3}\sqrt{\left(-1\right)^{5/6}\left(-1+\frac{\left(-b\right)^{1/3}x}{a^{1/3}}\right)}\;\sqrt{1+\frac{\left(-b\right)^{1/3}x}{a^{1/3}}+\frac{\left(-b\right)^{2/3}x^2}{a^{2/3}}}$$

$$\left(\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}-\frac{i\,\left(-b\right)^{1/3}x}{a^{1/3}}}}{3^{1/4}}\right],\,\left(-1\right)^{1/3}\right]+\left(-1\right)^{5/6}\right.$$

$$\left.\left.\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}-\frac{i\,\left(-b\right)^{1/3}x}{a^{1/3}}}}{3^{1/4}}\right],\,\left(-1\right)^{1/3}\right]\right)\right)\right)\Bigg/\left(273\left(-b\right)^{8/3}\sqrt{a+b\,x^3}\right)\right)$$

Problem 417: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a+b x^3}}\, dx$$

Optimal (type 4, 490 leaves, 4 steps):

$$\frac{2 x^2 \sqrt{a+b x^3}}{7 b}-\frac{8 a \sqrt{a+b x^3}}{7 b^{5/3}\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}+\left(4\times 3^{1/4} \sqrt{2-\sqrt{3}}\; a^{4/3}\left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(7 b^{5/3} \sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\; \sqrt{a+b x^3}\right)-\left(8 \sqrt{2}\; a^{4/3}\left(a^{1/3}+b^{1/3} x\right)\right.$$
$$\left.\sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(7\times 3^{1/4} b^{5/3} \sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\; \sqrt{a+b x^3}\right)$$

Result (type 4, 221 leaves):

$$\frac{2 x^2 \sqrt{a+b x^3}}{7 b}+\left(8 (-1)^{1/6} a^{5/3} \sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$
$$\left(-i \sqrt{3}\; \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\right.$$
$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(7\times 3^{1/4} (-b)^{5/3} \sqrt{a+b x^3}\right)$$

Problem 418: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 462 leaves, 3 steps):

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

Result (type 4, 197 leaves):

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

Problem 419: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 484 leaves, 4 steps):

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

Result (type 4, 217 leaves):

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

Problem 420: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^5 \sqrt{a+b x^3}} \, dx$$

Optimal (type 4, 514 leaves, 5 steps):

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

$$\left(5 \times 3^{1/4} \sqrt{2-\sqrt{3}}\; b^{4/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$

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

$$\left(16 a^{5/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)-\left(5 b^{4/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$

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

$$\left(4 \sqrt{2}\; 3^{1/4} a^{5/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 231 leaves):

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

Problem 428: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\left(a+b x^3\right)^{3/2}}\, dx$$

Optimal (type 4, 251 leaves, 3 steps):

$$-\frac{2 x^4}{3 b \sqrt{a+b x^3}}+\frac{16 x \sqrt{a+b x^3}}{15 b^2}-\left(32 \sqrt{2+\sqrt{3}}\, a \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(15\times 3^{1/4} b^{7/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 161 leaves):

$$\left(6 (-b)^{1/3} x \left(8 a + 3 b x^3\right) - 32 \, i \, 3^{3/4} a^{4/3} \sqrt{(-1)^{5/6} \left(-1 + \frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1 + \frac{(-b)^{1/3} x}{a^{1/3}} + \frac{(-b)^{2/3} x^2}{a^{2/3}}} \right.$$
$$\left. \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} - \frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right], (-1)^{1/3}\right]\right) \Big/ \left(45 (-b)^{7/3} \sqrt{a + b x^3}\right)$$

Problem 429: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 229 leaves, 2 steps):

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

Result (type 4, 151 leaves):

$$\left(6 (-b)^{1/3} x - 4 \, i \, 3^{3/4} a^{1/3} \sqrt{(-1)^{5/6} \left(-1 + \frac{(-b)^{1/3} x}{a^{1/3}}\right)} \sqrt{1 + \frac{(-b)^{1/3} x}{a^{1/3}} + \frac{(-b)^{2/3} x^2}{a^{2/3}}} \right.$$
$$\left. \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} - \frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right], (-1)^{1/3}\right]\right) \Big/ \left(9 (-b)^{4/3} \sqrt{a + b x^3}\right)$$

Problem 430: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 232 leaves, 2 steps):

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

Result (type 4, 154 leaves):

$$\left(6(-b)^{1/3}x+2\,i\,3^{3/4}a^{1/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}x}{a^{1/3}}\right)}\sqrt{1+\frac{(-b)^{1/3}x}{a^{1/3}}+\frac{(-b)^{2/3}x^2}{a^{2/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Bigg/\left(9a(-b)^{1/3}\sqrt{a+bx^3}\right)$$

Problem 431: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 255 leaves, 3 steps):

$$\frac{2}{3ax^2\sqrt{a+bx^3}}-\frac{7\sqrt{a+bx^3}}{6a^2x^2}-\left(7\sqrt{2+\sqrt{3}}\,b^{2/3}\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(6\times 3^{1/4}a^2\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{a+bx^3}\right)$$

Result (type 4, 170 leaves):

$$\left(-3\,(-b)^{1/3}\,(3\,a+7\,b\,x^3)-7\,i\,3^{3/4}\,a^{1/3}\,b\,x^2\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(18\,a^2\,(-b)^{1/3}\,x^2\,\sqrt{a+b\,x^3}\right)$$

Problem 432: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^6\,(a+b\,x^3)^{3/2}}\,dx$$

Optimal (type 4, 277 leaves, 4 steps):

$$\frac{2}{3\,a\,x^5\,\sqrt{a+b\,x^3}}-\frac{13\,\sqrt{a+b\,x^3}}{15\,a^2\,x^5}+\frac{91\,b\,\sqrt{a+b\,x^3}}{60\,a^3\,x^2}+$$

$$\left(91\,\sqrt{2+\sqrt{3}}\,\,b^{5/3}\,(a^{1/3}+b^{1/3}\,x)\,\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\right.$$

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

$$\left(60\times 3^{1/4}\,a^3\,\sqrt{\frac{a^{1/3}\,(a^{1/3}+b^{1/3}\,x)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 183 leaves):

$$\left(3\,(-b)^{1/3}\,(-12\,a^2+39\,a\,b\,x^3+91\,b^2\,x^6)+\right.$$

$$91\,i\,3^{3/4}\,a^{1/3}\,b^2\,x^5\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(180\,a^3\,(-b)^{1/3}\,x^5\,\sqrt{a+b\,x^3}\right)$$

Problem 433: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\left(a+b x^3\right)^{3/2}}\, dx$$

Optimal (type 4, 511 leaves, 5 steps):

$$-\frac{2 x^5}{3 b \sqrt{a+b x^3}}+\frac{20 x^2 \sqrt{a+b x^3}}{21 b^2}-\frac{80 a \sqrt{a+b x^3}}{21 b^{8/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}+$$

$$\left(40 \sqrt{2-\sqrt{3}}\, a^{4/3} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$

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

$$\left(7 \times 3^{3/4} b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)-\left(80 \sqrt{2}\, a^{4/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$

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

$$\left(21 \times 3^{1/4} b^{8/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 221 leaves):

$$\left(2\left(3\,(-b)^{2/3}x^2\left(10\,a+3\,b\,x^3\right)+\right.\right.$$

$$40\,(-1)^{2/3}\,3^{3/4}\,a^{5/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}$$

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

$$\left.\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)\right)\Big/\left(63\,(-b)^{8/3}\sqrt{a+b\,x^3}\right)$$

Problem 434: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 487 leaves, 4 steps):

$$-\frac{2 x^2}{3 b \sqrt{a+b x^3}}+\frac{8 \sqrt{a+b x^3}}{3 b^{5/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)}-$$

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

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

$$\left(3^{3/4} b^{5/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)+\left(8 \sqrt{2}\ a^{1/3} \left(a^{1/3}+b^{1/3} x\right)\right.$$

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

$$\left(3 \times 3^{1/4} b^{5/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 216 leaves) :

$$\frac{1}{9 b \sqrt{a+b x^3}}$$

$$2 \left(-3 x^2+\frac{1}{(-b)^{2/3}} 4 (-1)^{1/6} 3^{3/4} a^{2/3} \sqrt{\frac{(-1)^{5/6} \left(-a^{1/3}+(-b)^{1/3} x\right)}{a^{1/3}}} \sqrt{1+\frac{(-b)^{1/3} x}{a^{1/3}}+\frac{(-b)^{2/3} x^2}{a^{2/3}}}\right.$$

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

$$\left.\left.(-1)^{1/3}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3} x}{a^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 435: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 489 leaves, 4 steps):

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

Result (type 4, 212 leaves):

$$\frac{1}{9\,a\,\sqrt{a+b\,x^3}}\,2\left(3\,x^2+\frac{1}{(-b)^{2/3}}(-1)^{2/3}\,3^{3/4}\,a^{2/3}\sqrt{\frac{(-1)^{5/6}\left(-a^{1/3}+(-b)^{1/3}\,x\right)}{a^{1/3}}}\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\right.$$
$$\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]+\right.$$
$$\left.\left.(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)$$

Problem 436: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 513 leaves, 5 steps):

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

$$\left(5\,\sqrt{2-\sqrt{3}}\;b^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\,\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\right.$$

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

$$\left(2\times3^{3/4}\,a^{5/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\;\sqrt{a+b\,x^3}\right)+\left(5\,\sqrt{2}\;b^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\right.$$

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

$$\left(3\times3^{1/4}\,a^{5/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\;\sqrt{a+b\,x^3}\right)$$

Result (type 4, 226 leaves):

$$\left(-3\,(-b)^{2/3}\,\left(3\,a+5\,b\,x^3\right)-5\,(-1)^{2/3}\,3^{3/4}\,a^{2/3}\,b\,x\,\sqrt{(-1)^{5/6}\,\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\right.$$

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

$$\left.\left.(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)\Big/\left(9\,a^2\,(-b)^{2/3}\,x\,\sqrt{a+b\,x^3}\right)$$

Problem 437: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 535 leaves, 6 steps):

$$\frac{2}{3\,a\,x^4\,\sqrt{a+b\,x^3}}-\frac{11\,\sqrt{a+b\,x^3}}{12\,a^2\,x^4}+\frac{55\,b\,\sqrt{a+b\,x^3}}{24\,a^3\,x}-\frac{55\,b^{4/3}\,\sqrt{a+b\,x^3}}{24\,a^3\,\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)}+\left(55\,\sqrt{2-\sqrt{3}}\,\,b^{4/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\,\right]\right)\Bigg/\left(16\times 3^{3/4}\,a^{8/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\,\sqrt{a+b\,x^3}\right)-\left(55\,b^{4/3}\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\,\right]\right)\Bigg/\left(12\,\sqrt{2}\,\,3^{1/4}\,a^{8/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,x\right)^2}}\,\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 241 leaves):

$$\left(3\,(-b)^{2/3}\,\left(-6\,a^2+33\,a\,b\,x^3+55\,b^2\,x^6\right)+55\,(-1)^{2/3}\,3^{3/4}\,a^{2/3}\,b^2\,x^4\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}\,x}{a^{1/3}}\right)}\,\,\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\,\left(\sqrt{3}\,\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}\,x}{a^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)\Bigg/\left(72\,a^3\,(-b)^{2/3}\,x^4\,\sqrt{a+b\,x^3}\right)$$

Problem 446: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 136 leaves, 3 steps):

$$-\frac{16}{55}x\sqrt{1+x^3}+\frac{2}{11}x^4\sqrt{1+x^3}+\left(32\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(55\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)$$

Result (type 4, 108 leaves):

$$\frac{1}{165\sqrt{1+x^3}}2\left(3x\left(-8-3x^3+5x^6\right)+16(-1)^{1/6}3^{3/4}\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\sqrt{1+(-1)^{1/3}x+(-1)^{2/3}x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 447: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 120 leaves, 2 steps):

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

Result (type 4, 100 leaves):

$$\frac{1}{15\sqrt{1+x^3}}\left(6\left(x+x^4\right)-4\left(-1\right)^{1/6}3^{3/4}\sqrt{-\left(-1\right)^{1/6}\left(\left(-1\right)^{2/3}+x\right)}\right.$$
$$\left.\sqrt{1+\left(-1\right)^{1/3}x+\left(-1\right)^{2/3}x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}\left(1+x\right)}}{3^{1/4}}\right],\left(-1\right)^{1/3}\right]\right)$$

Problem 448: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 103 leaves, 1 step):

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

Result (type 4, 88 leaves):

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

Problem 449: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 122 leaves, 2 steps):

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

Result (type 4, 104 leaves):

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

Problem 450: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^6 \sqrt{1+x^3}}\, dx$$

Optimal (type 4, 138 leaves, 3 steps):

$$-\frac{\sqrt{1+x^3}}{5 x^5}+\frac{7 \sqrt{1+x^3}}{20 x^2}+$$
$$\left(7 \sqrt{2+\sqrt{3}}\ (1+x) \sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4 \sqrt{3}\right]\right)\Bigg/$$
$$\left(20\times 3^{1/4} \sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\ \sqrt{1+x^3}\right)$$

Result (type 4, 110 leaves):

$$\frac{1}{60 x^5 \sqrt{1+x^3}}$$
$$\left(-12+9 x^3+21 x^6+7 (-1)^{1/6} 3^{3/4} x^5 \sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\ \sqrt{1+(-1)^{1/3} x+(-1)^{2/3} x^2}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 451: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\sqrt{1+x^3}}\, dx$$

Optimal (type 4, 262 leaves, 5 steps):

$$-\frac{20}{91}x^2\sqrt{1+x^3}+\frac{2}{13}x^5\sqrt{1+x^3}+\frac{80\sqrt{1+x^3}}{91\left(1+\sqrt{3}+x\right)}-$$
$$\left(40\times 3^{1/4}\sqrt{2-\sqrt{3}}\ (1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(91\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\ \sqrt{1+x^3}\right)+$$
$$\frac{80\sqrt{2}\ (1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{91\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\ \sqrt{1+x^3}}$$

Result (type 4, 145 leaves):

$$\frac{1}{273\sqrt{1+x^3}}$$
$$2\left(3x^2\left(1+x^3\right)\left(-10+7x^3\right)-40\times 3^{3/4}\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\ \sqrt{1+(-1)^{1/3}x+(-1)^{2/3}x^2}\right.$$
$$\left(\sqrt{3}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$
$$\left.\left.(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 452: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 246 leaves, 4 steps):

$$\frac{2}{7}x^2\sqrt{1+x^3}-\frac{8\sqrt{1+x^3}}{7\left(1+\sqrt{3}+x\right)}+\left(4\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(7\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)-\frac{8\sqrt{2}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{7\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 138 leaves):

$$\frac{1}{21\sqrt{1+x^3}}2\left(3x^2\left(1+x^3\right)+4\times 3^{3/4}\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\sqrt{1+(-1)^{1/3}x+(-1)^{2/3}x^2}\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 453: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 224 leaves, 3 steps):

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

Result (type 4, 123 leaves) :

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

Problem 454: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 238 leaves, 4 steps) :

$$-\frac{\sqrt{1+x^3}}{x}+\frac{\sqrt{1+x^3}}{1+\sqrt{3}+x}-\left(3^{1/4}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(2\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)+\frac{\sqrt{2}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 138 leaves) :

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

Problem 455: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 262 leaves, 5 steps):

$$-\frac{\sqrt{1+x^3}}{4 x^4}+\frac{5 \sqrt{1+x^3}}{8 x}-\frac{5 \sqrt{1+x^3}}{8 \left(1+\sqrt{3}+x\right)}+\left(5\times 3^{1/4} \sqrt{2-\sqrt{3}} \,(1+x) \sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\; \text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(16 \sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}} \sqrt{1+x^3}\right)-\frac{5 (1+x) \sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4 \sqrt{3}\right]}{4 \sqrt{2}\; 3^{1/4} \sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}} \sqrt{1+x^3}}$$

Result (type 4, 145 leaves):

$$\frac{1}{24 \sqrt{1+x^3}}\left(\frac{3 \left(1+x^3\right) \left(-2+5 x^3\right)}{x^4}+5\times 3^{3/4} \sqrt{-(-1)^{1/6} \left((-1)^{2/3}+x\right)} \sqrt{1+(-1)^{1/3} x+(-1)^{2/3} x^2} \left(\sqrt{3}\; \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} (1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} (1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 464: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{1-x^3}}\, dx$$

Optimal (type 4, 152 leaves, 3 steps):

$$-\frac{16}{55} x \sqrt{1-x^3}-\frac{2}{11} x^4 \sqrt{1-x^3}-\left(32 \sqrt{2+\sqrt{3}}\, (1-x) \sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(55\times 3^{1/4} \sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}} \sqrt{1-x^3}\right)$$

Result (type 4, 93 leaves):

$$\frac{1}{165\sqrt{1-x^3}}2\left(3x\left(-8+3x^3+5x^6\right)+16\,\mathrm{i}\,3^{3/4}\sqrt{(-1)^{5/6}(-1+x)}\sqrt{1+x+x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 465: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 134 leaves, 2 steps):

$$-\frac{2}{5}x\sqrt{1-x^3}-\left(4\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(5\times3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}\right)$$

Result (type 4, 86 leaves):

$$\frac{1}{15\sqrt{1-x^3}}2\left(3x\left(-1+x^3\right)+2\,\mathrm{i}\,3^{3/4}\sqrt{(-1)^{5/6}(-1+x)}\sqrt{1+x+x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 466: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 115 leaves, 1 step):

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

Result (type 4, 73 leaves):

$$\frac{1}{3^{1/4}\sqrt{1-x^3}}2\,\mathrm{i}\,\sqrt{(-1)^{5/6}(-1+x)}\,\sqrt{1+x+x^2}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\Big],\,(-1)^{1/3}\Big]$$

Problem 467: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 136 leaves, 2 steps):

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

Result (type 4, 90 leaves):

$$\frac{1}{6x^2\sqrt{1-x^3}}\left(-3+3x^3+\mathrm{i}\,3^{3/4}\sqrt{(-1)^{5/6}(-1+x)}\,x^2\sqrt{1+x+x^2}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\Big],\,(-1)^{1/3}\Big]\right)$$

Problem 468: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^6\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 154 leaves, 3 steps):

$$-\frac{\sqrt{1-x^3}}{5x^5}-\frac{7\sqrt{1-x^3}}{20x^2}-\left(7\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\Big],-7-4\sqrt{3}\Big]\right)\Big/\left(20\times 3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}\right)$$

Result (type 4, 95 leaves):

$$\frac{1}{60\,x^5\sqrt{1-x^3}}\left(-12-9\,x^3+21\,x^6+7\,\mathrm{i}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\;x^5\sqrt{1+x+x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 469: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^7}{\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

$$\frac{80\sqrt{1-x^3}}{91\left(1+\sqrt{3}-x\right)}-\frac{20}{91}x^2\sqrt{1-x^3}-\frac{2}{13}x^5\sqrt{1-x^3}-\left(40\times3^{1/4}\sqrt{2-\sqrt{3}}\;(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],\,-7-4\sqrt{3}\right]\right)\Big/\left(91\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\;\sqrt{1-x^3}\right)+\frac{80\sqrt{2}\;(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],\,-7-4\sqrt{3}\right]}{91\times3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\;\sqrt{1-x^3}}$$

Result (type 4, 144 leaves):

$$\frac{1}{273\sqrt{1-x^3}}2\left(3\,x^2\,(-1+x^3)\,(10+7\,x^3)+40\,(-1)^{1/6}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\;\sqrt{1+x+x^2}\left(-\mathrm{i}\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],\,(-1)^{1/3}\right]+(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)$$

Problem 470: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 276 leaves, 4 steps):

$$\frac{8\sqrt{1-x^3}}{7\left(1+\sqrt{3}-x\right)}-\frac{2}{7}x^2\sqrt{1-x^3}-\left(4\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(7\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}\right)+\frac{8\sqrt{2}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{7\times 3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 137 leaves):

$$\frac{1}{21\sqrt{1-x^3}}2\left(3x^2\left(-1+x^3\right)+4(-1)^{1/6}3^{3/4}\sqrt{(-1)^{5/6}(-1+x)}\sqrt{1+x+x^2}\left(-i\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i x}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 471: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 252 leaves, 3 steps):

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

Result (type 4, 122 leaves):

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

Problem 472: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 270 leaves, 4 steps):

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

Result (type 4, 133 leaves):

$$\frac{1}{3\sqrt{1-x^3}}\left(\frac{3\left(-1+x^3\right)}{x}+(-1)^{2/3}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\right.$$
$$\sqrt{1+x+x^2}\left(\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$
$$\left.\left.(-1)^{5/6}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 473: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

$$-\frac{5\sqrt{1-x^3}}{8\left(1+\sqrt{3}-x\right)}-\frac{\sqrt{1-x^3}}{4x^4}-\frac{5\sqrt{1-x^3}}{8x}+$$
$$\left(5\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(16\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}\right)-\frac{5\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{4\sqrt{2}\,3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 145 leaves):

$$\frac{1}{24x^4\sqrt{1-x^3}}\left(3\left(-1+x^3\right)\left(2+5x^3\right)+\right.$$
$$\left(5\times 3^{3/4}\,(-1+x)\,x^4\sqrt{1+x+x^2}\left(-i\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.\right.$$
$$\left.\left.\left.(-1)^{1/3}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\sqrt{(-1)^{5/6}\,(-1+x)}\right)\right)$$

Problem 478: Result more than twice size of optimal antiderivative.

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

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

$$\frac{2}{3}\,\text{ArcTan}\left[\sqrt{-1+x^3}\right]$$

Result (type 3, 36 leaves):

$$\frac{2\sqrt{-1+x^3}\;\text{ArcTanh}\left[\sqrt{1-x^3}\right]}{3\sqrt{1-x^3}}$$

Problem 482: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 153 leaves, 3 steps):

$$\frac{16}{55}\,x\sqrt{-1+x^3}+\frac{2}{11}\,x^4\sqrt{-1+x^3}-\left(32\sqrt{2-\sqrt{3}}\;(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],\,-7+4\sqrt{3}\right]\right)\Big/\left(55\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\;\sqrt{-1+x^3}\right)$$

Result (type 4, 91 leaves):

$$\frac{1}{165\sqrt{-1+x^3}}2\left(3\,x\left(-8+3\,x^3+5\,x^6\right)+16\,i\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\;\sqrt{1+x+x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 483: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 137 leaves, 2 steps):

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

Result (type 4, 84 leaves):

$$\frac{1}{15\sqrt{-1+x^3}} 2 \left(3 x \left(-1+x^3\right) + 2 \, \mathrm{i} \, 3^{3/4} \sqrt{(-1)^{5/6} (-1+x)} \sqrt{1+x+x^2} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} - \mathrm{i} \, x}}{3^{1/4}}\right], (-1)^{1/3}\right]\right)$$

Problem 484: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 71 leaves):

$$\frac{1}{3^{1/4}\sqrt{-1+x^3}} 2 \, \mathrm{i} \sqrt{(-1)^{5/6} (-1+x)} \sqrt{1+x+x^2} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6} - \mathrm{i} \, x}}{3^{1/4}}\right], (-1)^{1/3}\right]$$

Problem 485: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 139 leaves, 2 steps):

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

Result (type 4, 90 leaves):

$$\frac{\sqrt{-1+x^3}}{2\,x^2}+\frac{1}{2\times 3^{1/4}\sqrt{-1+x^3}}$$
$$\mathrm{i}\sqrt{(-1)^{5/6}\,(-1+x)}\;\sqrt{1+x+x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]$$

Problem 486: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^6\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 155 leaves, 3 steps):

$$\frac{\sqrt{-1+x^3}}{5\,x^5}+\frac{7\sqrt{-1+x^3}}{20\,x^2}-$$
$$\left(7\sqrt{2-\sqrt{3}}\;(1-x)\,\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(20\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\;\sqrt{-1+x^3}\right)$$

Result (type 4, 93 leaves):

$$\frac{1}{60\,x^5\sqrt{-1+x^3}}\left(-12-9\,x^3+21\,x^6+\right.$$
$$\left.7\,\mathrm{i}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\;x^5\sqrt{1+x+x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 487: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^7}{\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

$$-\frac{80\sqrt{-1+x^3}}{91\left(1-\sqrt{3}-x\right)}+\frac{20}{91}x^2\sqrt{-1+x^3}+\frac{2}{13}x^5\sqrt{-1+x^3}+$$

$$\left(40\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(91\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}\right)-$$

$$\frac{80\sqrt{2}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{91\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 142 leaves) :

$$\frac{1}{273\sqrt{-1+x^3}}2\left(3x^2\left(-1+x^3\right)\left(10+7x^3\right)+40\,(-1)^{1/6}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\right.$$

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

$$\left.\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 488: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 278 leaves, 4 steps) :

$$-\frac{8\sqrt{-1+x^3}}{7\left(1-\sqrt{3}-x\right)}+\frac{2}{7}x^2\sqrt{-1+x^3}+$$

$$\left(4\times 3^{1/4}\sqrt{2+\sqrt{3}}\ (1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(7\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\ \sqrt{-1+x^3}\right)-$$

$$\frac{8\sqrt{2}\ (1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{7\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\ \sqrt{-1+x^3}}$$

Result (type 4, 135 leaves):

$$\frac{1}{21\sqrt{-1+x^3}}2\left(3x^2\left(-1+x^3\right)+4\,(-1)^{1/6}\,3^{3/4}\sqrt{(-1)^{5/6}\,(-1+x)}\right.$$

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

$$\left.\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\mathrm{i}\,x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 489: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 255 leaves, 3 steps):

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

Result (type 4, 120 leaves) :

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

Problem 490: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 269 leaves, 4 steps) :

$$\frac{\sqrt{-1+x^3}}{1-\sqrt{3}-x}+\frac{\sqrt{-1+x^3}}{x}-\left(3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(2\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}\right)+\frac{\sqrt{2}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}}$$

Result (type 4, 130 leaves):

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

Problem 491: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

$$\frac{5\sqrt{-1+x^3}}{8\left(1-\sqrt{3}-x\right)}+\frac{\sqrt{-1+x^3}}{4x^4}+\frac{5\sqrt{-1+x^3}}{8x}-$$
$$\left(5\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(16\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}\right)+$$
$$\frac{5\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{4\sqrt{2}\,3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 140 leaves):

$$\frac{1}{24\sqrt{-1+x^3}}\left(\frac{3\left(-1+x^3\right)\left(2+5x^3\right)}{x^4}+\right.$$
$$\left(5\times 3^{3/4}(-1+x)\sqrt{1+x+x^2}\left(-i\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i x}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.\right.$$
$$\left.\left.\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-i x}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\sqrt{(-1)^{5/6}(-1+x)}\right)\right)$$

Problem 496: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 16 leaves, 3 steps):

$$\frac{2}{3}\text{ArcTan}\left[\sqrt{-1-x^3}\right]$$

Result (type 3, 34 leaves):

$$\frac{2\sqrt{-1-x^3}\,\text{ArcTanh}\left[\sqrt{1+x^3}\right]}{3\sqrt{1+x^3}}$$

Problem 500: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^6}{\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 149 leaves, 3 steps):

$$\frac{16}{55}x\sqrt{-1-x^3}-\frac{2}{11}x^4\sqrt{-1-x^3}+\left(32\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Big/\left(55\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}\right)$$

Result (type 4, 115 leaves):

$$\frac{1}{165\sqrt{-1-x^3}}2\left(3x\left(-8-3x^3+5x^6\right)+16(-1)^{5/6}\,3^{3/4}\sqrt{-(-1)^{5/6}+i x}\sqrt{1-(-1)^{2/3}x-(-1)^{1/3}x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 501: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 131 leaves, 2 steps):

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

Result (type 4, 107 leaves):

$$\frac{1}{15\sqrt{-1-x^3}}\left(6\left(x+x^4\right)-4\left(-1\right)^{5/6}3^{3/4}\sqrt{-\left(-1\right)^{5/6}+\mathrm{i}\,x}\right.$$
$$\left.\sqrt{1-\left(-1\right)^{2/3}x-\left(-1\right)^{1/3}x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{1/6}\left(\left(-1\right)^{2/3}+x\right)}}{3^{1/4}}\right],\left(-1\right)^{1/3}\right]\right)$$

Problem 502: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 112 leaves, 1 step):

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

Result (type 4, 95 leaves):

$$\frac{1}{3^{1/4}\sqrt{-1-x^3}}2\left(-1\right)^{5/6}\sqrt{-\left(-1\right)^{5/6}+\mathrm{i}\,x}\sqrt{1-\left(-1\right)^{2/3}x-\left(-1\right)^{1/3}x^2}$$
$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{1/6}\left(\left(-1\right)^{2/3}+x\right)}}{3^{1/4}}\right],\left(-1\right)^{1/3}\right]$$

Problem 503: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 133 leaves, 2 steps):

$$\frac{\sqrt{-1-x^3}}{2x^2}-\left(\sqrt{2-\sqrt{3}}\left(1+x\right)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(2\times3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}\right)$$

Result (type 4, 111 leaves):

$$-\frac{1}{6\,x^2\,\sqrt{-1-x^3}}\left(3+3\,x^3+(-1)^{5/6}\,3^{3/4}\,\sqrt{-(-1)^{5/6}+i\,x}\;x^2\,\sqrt{1-(-1)^{2/3}\,x-(-1)^{1/3}\,x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 504: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^6\,\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 151 leaves, 3 steps):

$$\frac{\sqrt{-1-x^3}}{5\,x^5}-\frac{7\,\sqrt{-1-x^3}}{20\,x^2}+\left(7\,\sqrt{2-\sqrt{3}}\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],\,-7+4\,\sqrt{3}\right]\right)\Big/\left(20\times 3^{1/4}\,\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}\right)$$

Result (type 4, 117 leaves):

$$\frac{1}{60\,x^5\,\sqrt{-1-x^3}}\left(-12+9\,x^3+21\,x^6+7\,(-1)^{5/6}\,3^{3/4}\,\sqrt{-(-1)^{5/6}+i\,x}\;x^5\,\sqrt{1-(-1)^{2/3}\,x-(-1)^{1/3}\,x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 505: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^7}{\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 282 leaves, 5 steps):

$$\frac{20}{91}x^2\sqrt{-1-x^3}-\frac{2}{13}x^5\sqrt{-1-x^3}-\frac{80\sqrt{-1-x^3}}{91\left(1-\sqrt{3}+x\right)}+\left(40\times 3^{1/4}\sqrt{2+\sqrt{3}}\ (1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(91\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}\right)-\frac{80\sqrt{2}\ (1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{91\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 164 leaves):

$$\frac{1}{273\sqrt{-1-x^3}}2\left(3x^2\left(1+x^3\right)\left(-10+7x^3\right)+40\,(-1)^{5/6}\,3^{3/4}\sqrt{-(-1)^{5/6}+\mathrm{i}\,x}\ \sqrt{1-(-1)^{2/3}x-(-1)^{1/3}x^2}\left(-\mathrm{i}\sqrt{3}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 506: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 264 leaves, 4 steps):

$$-\frac{2}{7}x^2\sqrt{-1-x^3}+\frac{8\sqrt{-1-x^3}}{7\left(1-\sqrt{3}+x\right)}-$$

$$\left(4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(7\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}\right)+$$

$$\frac{8\sqrt{2}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{7\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 157 leaves):

$$\frac{1}{21\sqrt{-1-x^3}}2\left(3x^2\left(1+x^3\right)-4\,(-1)^{5/6}\,3^{3/4}\sqrt{-(-1)^{5/6}+\mathrm{i}\,x}\,\sqrt{1-(-1)^{2/3}x-(-1)^{1/3}x^2}\right.$$

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

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

Problem 507: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 239 leaves, 3 steps):

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

Result (type 4, 142 leaves):

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

Problem 508: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 257 leaves, 4 steps):

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

Result (type 4, 156 leaves):

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

Problem 509: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 282 leaves, 5 steps):

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

$$\left(5\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

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

Result (type 4, 164 leaves):

$$\frac{1}{24\sqrt{-1-x^3}}\left(\frac{3\left(1+x^3\right)\left(-2+5x^3\right)}{x^4}-5\,(-1)^{5/6}\,3^{3/4}\sqrt{-(-1)^{5/6}+i\,x}\sqrt{1-(-1)^{2/3}x-(-1)^{1/3}x^2}\right.$$

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

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

Problem 514: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 95 leaves, 6 steps):

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

Result (type 5, 61 leaves):

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

Problem 515: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 67 leaves):

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

Problem 516: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 173 leaves, 9 steps):

$$\frac{a x^2\left(a+b x^3\right)^{1/3}}{18 b}+\frac{1}{6} x^5\left(a+b x^3\right)^{1/3}+\frac{a^2 \,\text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} x}{\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{9\sqrt{3}\, b^{5/3}}+$$
$$\frac{a^2 \,\text{Log}\left[1-\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{27 b^{5/3}}-\frac{a^2 \,\text{Log}\left[1+\frac{b^{2/3} x^2}{\left(a+b x^3\right)^{2/3}}+\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{54 b^{5/3}}$$

Result (type 5, 78 leaves):

$$\frac{1}{18 b\left(a+b x^3\right)^{2/3}} x^2\left(a^2+4 a b x^3+3 b^2 x^6-a^2\left(1+\frac{b x^3}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^3}{a}\right]\right)$$

Problem 517: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 145 leaves, 8 steps):

$$\frac{1}{3} x^2\left(a+b x^3\right)^{1/3}-\frac{a \,\text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} x}{\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\sqrt{3}\, b^{2/3}}-\frac{a \,\text{Log}\left[1-\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{9 b^{2/3}}+\frac{a \,\text{Log}\left[1+\frac{b^{2/3} x^2}{\left(a+b x^3\right)^{2/3}}+\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{18 b^{2/3}}$$

Result (type 5, 63 leaves):

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

Problem 518: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 138 leaves, 8 steps):

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

Result (type 5, 66 leaves):

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

Problem 523: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 5, 33 leaves, 2 steps):

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

Result (type 6, 196 leaves):

$$\left(3 \left((-1)^{2/3} a^{1/3}+b^{1/3} x\right) \left(a+b x^3\right)^{1/3} \text{AppellF1}\left[\frac{4}{3},-\frac{1}{3},-\frac{1}{3},\frac{7}{3},-\frac{i \left((-1)^{2/3} a^{1/3}+b^{1/3} x\right)}{\sqrt{3}\, a^{1/3}},\frac{i+\sqrt{3}-\frac{2 i b^{1/3} x}{a^{1/3}}}{3 i+\sqrt{3}}\right]\right) \Big/ \left(4\times 2^{1/3} b^{1/3} \left(\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}\right)^{1/3} \left(\frac{i \left(1+\frac{b^{1/3} x}{a^{1/3}}\right)}{3 i+\sqrt{3}}\right)^{1/3}\right)$$

Problem 525: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^{1/3}}{x^6} \, dx$$

Optimal (type 5, 38 leaves, 2 steps):

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

Result (type 5, 83 leaves):

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

Problem 530: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 98 leaves, 6 steps):

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

Result (type 5, 58 leaves):

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

Problem 531: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 67 leaves):

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

Problem 532: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 38 leaves, 2 steps):

$$\frac{x^5 \left(a+b x^3\right)^{5/3} \text{Hypergeometric2F1}\left[1,\frac{10}{3},\frac{8}{3},-\frac{b x^3}{a}\right]}{5 a}$$

Result (type 5, 78 leaves):

$$\frac{1}{14 b \left(a+b x^3\right)^{1/3}} x^2 \left(a^2+3 a b x^3+2 b^2 x^6-a^2 \left(1+\frac{b x^3}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^3}{a}\right]\right)$$

Problem 535: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^{2/3}}{x^5} dx$$

Optimal (type 5, 38 leaves, 2 steps):

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

Result (type 5, 82 leaves):

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

Problem 537: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 91 leaves, 2 steps):

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

Result (type 6, 196 leaves):

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

$$\left.\text{AppellF1}\left[\frac{5}{3},-\frac{2}{3},-\frac{2}{3},\frac{8}{3},-\frac{i\left((-1)^{2/3}a^{1/3}+b^{1/3}x\right)}{\sqrt{3}\,a^{1/3}},\frac{i+\sqrt{3}-\frac{2\,i\,b^{1/3}x}{a^{1/3}}}{3\,i+\sqrt{3}}\right]\right)\Bigg/$$

$$\left(5\times 2^{2/3}b^{1/3}\left(\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}\right)^{2/3}\left(\frac{i\left(1+\frac{b^{1/3}x}{a^{1/3}}\right)}{3\,i+\sqrt{3}}\right)^{2/3}\right)$$

Problem 547: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 83 leaves, 5 steps):

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

Result (type 5, 46 leaves):

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

Problem 548: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 110 leaves, 6 steps):

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

Result (type 5, 69 leaves):

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

Problem 549: Result more than twice size of optimal antiderivative.

$$\int\frac{x^7}{\left(a+b x^3\right)^{1/3}}\,dx$$

Optimal (type 5, 38 leaves, 2 steps):

$$\frac{x^8 \left(a+b x^3\right)^{2/3} \text{Hypergeometric2F1}\left[1,\frac{10}{3},\frac{11}{3},-\frac{b x^3}{a}\right]}{8 a}$$

Result (type 5, 80 leaves):

$$\frac{1}{28 b^2 \left(a+b x^3\right)^{1/3}} x^2 \left(-5 a^2-a b x^3+4 b^2 x^6+5 a^2 \left(1+\frac{b x^3}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^3}{a}\right]\right)$$

Problem 553: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^5 \left(a+b x^3\right)^{1/3}} \, dx$$

Optimal (type 5, 38 leaves, 2 steps):

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

Result (type 5, 82 leaves):

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

Problem 564: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 84 leaves, 5 steps):

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

Result (type 5, 48 leaves):

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

Problem 565: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 110 leaves, 6 steps):

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

Result (type 5, 69 leaves):

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

Problem 566: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 148 leaves, 8 steps):

$$\frac{x^2 \left(a+b x^3\right)^{1/3}}{3 b}+\frac{2 a \operatorname{ArcTan}\left[\frac{1+\frac{2 b^{1/3} x}{\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3 \sqrt{3}\, b^{5/3}}+\frac{2 a \operatorname{Log}\left[1-\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{9 b^{5/3}}-\frac{a \operatorname{Log}\left[1+\frac{b^{2/3} x^2}{\left(a+b x^3\right)^{2/3}}+\frac{b^{1/3} x}{\left(a+b x^3\right)^{1/3}}\right]}{9 b^{5/3}}$$

Result (type 5, 64 leaves):

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

Problem 567: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 72 leaves, 7 steps):

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

Result (type 5, 52 leaves):

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

Problem 572: Result more than twice size of optimal antiderivative.

$$\int \frac{x^6}{\left(a+b x^3\right)^{2/3}}\, dx$$

Optimal (type 5, 38 leaves, 2 steps):

$$\frac{x^7 \left(a+b x^3\right)^{1/3} \text{Hypergeometric2F1}\left[1, \frac{8}{3}, \frac{10}{3}, -\frac{b x^3}{a}\right]}{7 a}$$

Result (type 5, 78 leaves):

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

Problem 574: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 5, 33 leaves, 2 steps):

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

Result (type 5, 177 leaves):

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

Problem 576: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^6 \left(a+b x^3\right)^{2/3}} \, dx$$

Optimal (type 5, 38 leaves, 2 steps):

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

Result (type 5, 82 leaves):

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

Problem 579: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 49 leaves, 7 steps):

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

Result (type 5, 20 leaves):

$$\frac{1}{2}\,x^2\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},x^3\right]$$

Problem 633: Result more than twice size of optimal antiderivative.

$$\int x^3\left(a+b\,x^4\right)^3\,dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b\,x^4\right)^4}{16\,b}$$

Result (type 1, 43 leaves):

$$\frac{a^3\,x^4}{4}+\frac{3}{8}\,a^2\,b\,x^8+\frac{1}{4}\,a\,b^2\,x^{12}+\frac{b^3\,x^{16}}{16}$$

Problem 774: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\,\sqrt{a+c\,x^4}\,dx$$

Optimal (type 4, 127 leaves, 3 steps):

$$\frac{2\,a\,x\,\sqrt{a+c\,x^4}}{21\,c}+\frac{1}{7}\,x^5\,\sqrt{a+c\,x^4}-\frac{a^{7/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{21\,c^{5/4}\,\sqrt{a+c\,x^4}}$$

Result (type 4, 106 leaves):

$$\frac{2\,a^2\,x+5\,a\,c\,x^5+3\,c^2\,x^9+\frac{2\,i\,a^2\,\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}}}{21\,c\,\sqrt{a+c\,x^4}}$$

Problem 775: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{a+c\,x^4}\,dx$$

Optimal (type 4, 105 leaves, 2 steps):

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

Result (type 4, 89 leaves):

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

Problem 776: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+c x^4}}{x^4} \, dx$$

Optimal (type 4, 107 leaves, 2 steps):

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

Result (type 4, 92 leaves):

$$\frac{-\frac{a+c x^4}{x^3}-\frac{2 i c \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{3 \sqrt{a+c x^4}}$$

Problem 777: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+c x^4}}{x^8} \, dx$$

Optimal (type 4, 129 leaves, 3 steps):

$$-\frac{\sqrt{a+c x^4}}{7 x^7}-\frac{2 c \sqrt{a+c x^4}}{21 a x^3}-\frac{c^{7/4} \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{21 a^{5/4} \sqrt{a+c x^4}}$$

Result (type 4, 106 leaves):

$$\frac{-\frac{3a^2}{x^7}-\frac{5ac}{x^3}-2c^2x+\frac{2\,\mathrm{i}\,c^2\sqrt{1+\frac{cx^4}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}}}{21\,a\sqrt{a+cx^4}}$$

Problem 778: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\sqrt{a+cx^4}\,dx$$

Optimal (type 4, 234 leaves, 4 steps):

$$\frac{1}{5}x^3\sqrt{a+cx^4}+\frac{2ax\sqrt{a+cx^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}\,x^2\right)}-\frac{2a^{5/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]}{5c^{3/4}\sqrt{a+cx^4}}+\frac{a^{5/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]}{5c^{3/4}\sqrt{a+cx^4}}$$

Result (type 4, 121 leaves):

$$\frac{1}{5\sqrt{a+cx^4}}\left(x^3\left(a+cx^4\right)+\frac{1}{\left(\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}\right)^{3/2}}2\,\mathrm{i}\,a\sqrt{1+\frac{cx^4}{a}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)\right)$$

Problem 779: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+cx^4}}{x^2}\,dx$$

Optimal (type 4, 224 leaves, 4 steps):

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

Result (type 4, 119 leaves):

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

Problem 780: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+c x^4}}{x^6}\, dx$$

Optimal (type 4, 258 leaves, 5 steps):

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

Result (type 4, 133 leaves):

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

Problem 794: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4 \left(a+c x^4\right)^{3/2} dx$$

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

$$\frac{4 a^2 x \sqrt{a+c x^4}}{77 c}+\frac{6}{77} a x^5 \sqrt{a+c x^4}+\frac{1}{11} x^5 \left(a+c x^4\right)^{3/2}-\frac{2 a^{11/4} \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{77 c^{5/4} \sqrt{a+c x^4}}$$

Result (type 4, 117 leaves):

$$\frac{1}{77 c \sqrt{a+c x^4}}\left(4 a^3 x+17 a^2 c x^5+20 a c^2 x^9+7 c^3 x^{13}+\frac{4 i a^3 \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}\right)$$

Problem 795: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a+c x^4\right)^{3/2} dx$$

Optimal (type 4, 122 leaves, 3 steps):

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

Result (type 4, 102 leaves):

$$\frac{3 a^2 x+4 a c x^5+c^2 x^9-\frac{4 i a^2 \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{7 \sqrt{a+c x^4}}$$

Problem 796: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+c x^4\right)^{3/2}}{x^4} dx$$

Optimal (type 4, 124 leaves, 3 steps):

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

Result (type 4, 96 leaves):

$$\frac{-\frac{a^2}{x^3}+c^2 x^5-\frac{4 i a c \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{3 \sqrt{a+c x^4}}$$

Problem 797: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+c x^4\right)^{3/2}}{x^8} \, dx$$

Optimal (type 4, 126 leaves, 3 steps):

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

Result (type 4, 106 leaves):

$$\frac{-\frac{a^2+4 a c x^4+3 c^2 x^8}{x^7}-\frac{4 i c^2 \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{7 \sqrt{a+c x^4}}$$

Problem 798: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 \left(a+c x^4\right)^{3/2} \, dx$$

Optimal (type 4, 255 leaves, 5 steps):

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

Result (type 4, 133 leaves):

$$\frac{1}{45 \sqrt{a+c x^4}}\left(\left(a+c x^4\right) \left(11 a x^3+5 c x^7\right)+\frac{1}{\left(\frac{i \sqrt{c}}{\sqrt{a}}\right)^{3/2}} 12 i a^2 \sqrt{1+\frac{c x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]\right)\right)$$

Problem 799: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 251 leaves, 5 steps):

$$\frac{6}{5} c x^3 \sqrt{a+c x^4}+\frac{12 a \sqrt{c} x \sqrt{a+c x^4}}{5 \left(\sqrt{a}+\sqrt{c} x^2\right)}-\frac{\left(a+c x^4\right)^{3/2}}{x}-\frac{1}{5 \sqrt{a+c x^4}}$$
$$12 a^{5/4} c^{1/4} \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]+$$
$$\frac{1}{5 \sqrt{a+c x^4}} 6 a^{5/4} c^{1/4} \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]$$

Result (type 4, 136 leaves):

$$\left(-\frac{a}{x}+\frac{c\,x^3}{5}\right)\sqrt{a+c\,x^4}+\left(12\,\mathrm{i}\,a\,c\,\sqrt{1+\frac{c\,x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)\right)\bigg/\left(5\right.$$
$$\left.\left(\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}\right)^{3/2}\sqrt{a+c\,x^4}\right)$$

Problem 800: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+c\,x^4\right)^{3/2}}{x^6}\,dx$$

Optimal (type 4, 252 leaves, 5 steps):

$$-\frac{6\,c\,\sqrt{a+c\,x^4}}{5\,x}+\frac{12\,c^{3/2}\,x\,\sqrt{a+c\,x^4}}{5\left(\sqrt{a}+\sqrt{c}\,x^2\right)}-\frac{\left(a+c\,x^4\right)^{3/2}}{5\,x^5}-\frac{1}{5\,\sqrt{a+c\,x^4}}$$
$$12\,a^{1/4}\,c^{5/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]+$$
$$\frac{1}{5\,\sqrt{a+c\,x^4}}6\,a^{1/4}\,c^{5/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]$$

Result (type 4, 132 leaves):

$$\frac{1}{5\,\sqrt{a+c\,x^4}}\left(-\frac{\left(a+c\,x^4\right)\left(a+7\,c\,x^4\right)}{x^5}+\frac{1}{\left(\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}\right)^{3/2}}12\,\mathrm{i}\,c^2\,\sqrt{1+\frac{c\,x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)\right)$$

Problem 801: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(1+x^4\right)^{3/2}\,dx$$

Optimal (type 4, 72 leaves, 3 steps):

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

Result (type 4, 55 leaves):

$$\frac{1}{7\sqrt{1+x^4}}\left(3\,x+4\,x^5+x^9-4\,(-1)^{1/4}\sqrt{1+x^4}\,\text{EllipticF}\left[\,\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],\,-1\right]\right)$$

Problem 807: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{1+x^4}\,dx$$

Optimal (type 4, 58 leaves, 2 steps):

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

Result (type 4, 48 leaves):

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

Problem 819: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^8}{\sqrt{a+b\,x^4}}\,dx$$

Optimal (type 4, 130 leaves, 3 steps):

$$-\frac{5\,a\,x\,\sqrt{a+b\,x^4}}{21\,b^2}+\frac{x^5\,\sqrt{a+b\,x^4}}{7\,b}+\frac{5\,a^{7/4}\left(\sqrt{a}+\sqrt{b}\,x^2\right)\sqrt{\frac{a+b\,x^4}{\left(\sqrt{a}+\sqrt{b}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\,\frac{1}{2}\right]}{42\,b^{9/4}\,\sqrt{a+b\,x^4}}$$

Result (type 4, 106 leaves):

$$\frac{-5\,a^2\,x-2\,a\,b\,x^5+3\,b^2\,x^9-\frac{5\,\mathbb{i}\,a^2\,\sqrt{1+\frac{b\,x^4}{a}}\,\text{EllipticF}\left[\,\mathbb{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathbb{i}\,\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{\mathbb{i}\,\sqrt{b}}{\sqrt{a}}}}}{21\,b^2\,\sqrt{a+b\,x^4}}$$

Problem 820: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{a+b\,x^4}}\,dx$$

Optimal (type 4, 108 leaves, 2 steps):

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

Result (type 4, 92 leaves):

$$\frac{x\left(a+b x^4\right)+\frac{i a\sqrt{1+\frac{b x^4}{a}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}}{3 b\sqrt{a+b x^4}}$$

Problem 821: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

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

Result (type 4, 74 leaves):

$$-\frac{i\sqrt{1+\frac{b x^4}{a}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ \sqrt{a+b x^4}}$$

Problem 822: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 110 leaves, 2 steps):

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

Result (type 4, 95 leaves):

$$\frac{-\frac{a+b x^4}{x^3}+\frac{i b\sqrt{1+\frac{b x^4}{a}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}}{3 a\sqrt{a+b x^4}}$$

Problem 823: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^8 \sqrt{a + b x^4}} \, dx$$

Optimal (type 4, 132 leaves, 3 steps):

$$-\frac{\sqrt{a+b x^4}}{7 a x^7}+\frac{5 b \sqrt{a+b x^4}}{21 a^2 x^3}+\frac{5 b^{7/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{42 a^{9/4} \sqrt{a+b x^4}}$$

Result (type 4, 106 leaves):

$$\frac{-\frac{3 a^2}{x^7}+\frac{2 a b}{x^3}+5 b^2 x-\frac{5 i b^2 \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}}}{21 a^2 \sqrt{a+b x^4}}$$

Problem 824: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{10}}{\sqrt{a + b x^4}} \, dx$$

Optimal (type 4, 261 leaves, 5 steps):

$$-\frac{7 a x^3 \sqrt{a+b x^4}}{45 b^2}+\frac{x^7 \sqrt{a+b x^4}}{9 b}+\frac{7 a^2 x \sqrt{a+b x^4}}{15 b^{5/2} \left(\sqrt{a}+\sqrt{b} x^2\right)}-$$

$$\frac{7 a^{9/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{15 b^{11/4} \sqrt{a+b x^4}}+$$

$$\frac{7 a^{9/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{30 b^{11/4} \sqrt{a+b x^4}}$$

Result (type 4, 136 leaves):

$$\frac{1}{45 b^2 \sqrt{a+b x^4}}\left(\left(a+b x^4\right) \left(-7 a x^3+5 b x^7\right)+\frac{1}{\left(\frac{i \sqrt{b}}{\sqrt{a}}\right)^{3/2}} 21 i a^2 \sqrt{1+\frac{b x^4}{a}}\right.$$

$$\left.\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]\right)\right)$$

Problem 825: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a+b x^4}} \, dx$$

Optimal (type 4, 237 leaves, 4 steps):

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

Result (type 4, 168 leaves):

$$\frac{x^3 \sqrt{a+b x^4}}{5 b}-\left(3 a^{3/2} \sqrt{1-\frac{i \sqrt{b} x^2}{\sqrt{a}}} \sqrt{1+\frac{i \sqrt{b} x^2}{\sqrt{a}}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]\right)\right) \Bigg/ \left(5 \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} b^{3/2} \sqrt{a+b x^4}\right)$$

Problem 826: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{a+b x^4}} \, dx$$

Optimal (type 4, 210 leaves, 3 steps):

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

Result (type 4, 104 leaves):

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

Problem 827: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^2 \sqrt{a+b x^4}}\, dx$$

Optimal (type 4, 232 leaves, 4 steps):

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

Result (type 4, 121 leaves):

$$\frac{1}{\sqrt{a+b x^4}} \left(-\frac{a+b x^4}{a x}-i \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} \sqrt{1+\frac{b x^4}{a}} \left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]-\text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]\right)\right)$$

Problem 828: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^6 \sqrt{a+b x^4}}\, dx$$

Optimal (type 4, 261 leaves, 5 steps):

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

Result (type 4, 135 leaves):

$$\frac{1}{5 a^2 \sqrt{a+b x^4}}\left(\frac{\left(a+b x^4\right) \left(-a+3 b x^4\right)}{x^5}+3 i a \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} b \sqrt{1+\frac{b x^4}{a}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]\right)\right)$$

Problem 839: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^8}{\sqrt{a-b x^4}} \, dx$$

Optimal (type 4, 100 leaves, 4 steps):

$$-\frac{5 a x \sqrt{a-b x^4}}{21 b^2}-\frac{x^5 \sqrt{a-b x^4}}{7 b}+\frac{5 a^{9/4} \sqrt{1-\frac{b x^4}{a}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{21 b^{9/4} \sqrt{a-b x^4}}$$

Result (type 4, 122 leaves):

$$\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x \left(-5 a^2+2 a b x^4+3 b^2 x^8\right)-5 i a^2 \sqrt{1-\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x\right],-1\right]\right) \Big/ \left(21 \sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} b^2 \sqrt{a-b x^4}\right)$$

Problem 840: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a-b x^4}} \, dx$$

Optimal (type 4, 77 leaves, 3 steps):

$$-\frac{x\sqrt{a-b\,x^4}}{3\,b}+\frac{a^{5/4}\sqrt{1-\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\,-1\right]}{3\,b^{5/4}\sqrt{a-b\,x^4}}$$

Result (type 4, 108 leaves):

$$\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\;x\left(-a+b\,x^4\right)-\text{i}\,a\sqrt{1-\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\;x\right],\,-1\right]\right)\Bigg/$$
$$\left(3\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\;b\sqrt{a-b\,x^4}\right)$$

Problem 841: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 53 leaves, 2 steps):

$$\frac{a^{1/4}\sqrt{1-\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\,-1\right]}{b^{1/4}\sqrt{a-b\,x^4}}$$

Result (type 4, 72 leaves):

$$-\frac{\text{i}\sqrt{1-\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\;x\right],\,-1\right]}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\;\sqrt{a-b\,x^4}}$$

Problem 842: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{\sqrt{a-b\,x^4}}{3\,a\,x^3}+\frac{b^{3/4}\sqrt{1-\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\,-1\right]}{3\,a^{3/4}\sqrt{a-b\,x^4}}$$

Result (type 4, 90 leaves):

$$\frac{-\frac{a}{x^3}+b\,x-\frac{i\,b\,\sqrt{1-\frac{b\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}}}{3\,a\,\sqrt{a-b\,x^4}}$$

Problem 843: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^8\,\sqrt{a-b\,x^4}}\,dx$$

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

$$-\frac{\sqrt{a-b\,x^4}}{7\,a\,x^7}-\frac{5\,b\,\sqrt{a-b\,x^4}}{21\,a^2\,x^3}+\frac{5\,b^{7/4}\,\sqrt{1-\frac{b\,x^4}{a}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],-1\right]}{21\,a^{7/4}\,\sqrt{a-b\,x^4}}$$

Result (type 4, 104 leaves):

$$\frac{-\frac{3\,a^2}{x^7}-\frac{2\,a\,b}{x^3}+5\,b^2\,x-\frac{5\,i\,b^2\,\sqrt{1-\frac{b\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}}}{21\,a^2\,\sqrt{a-b\,x^4}}$$

Problem 844: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{10}}{\sqrt{a-b\,x^4}}\,dx$$

Optimal (type 4, 158 leaves, 8 steps):

$$-\frac{7\,a\,x^3\,\sqrt{a-b\,x^4}}{45\,b^2}-\frac{x^7\,\sqrt{a-b\,x^4}}{9\,b}+\frac{7\,a^{11/4}\,\sqrt{1-\frac{b\,x^4}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],-1\right]}{15\,b^{11/4}\,\sqrt{a-b\,x^4}}-$$
$$\frac{7\,a^{11/4}\,\sqrt{1-\frac{b\,x^4}{a}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],-1\right]}{15\,b^{11/4}\,\sqrt{a-b\,x^4}}$$

Result (type 4, 134 leaves):

$$\frac{1}{45 b^2 \sqrt{a-b x^4}}\left(\left(-a+b x^4\right)\left(7 a x^3+5 b x^7\right)+\frac{1}{\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2}} 21\, i\, a^2 \sqrt{1-\frac{b x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]-\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]\right)\right)$$

Problem 845: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a-b x^4}}\, dx$$

Optimal (type 4, 135 leaves, 7 steps):

$$-\frac{x^3 \sqrt{a-b x^4}}{5 b}+\frac{3 a^{7/4} \sqrt{1-\frac{b x^4}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{5 b^{7/4} \sqrt{a-b x^4}}-$$
$$\frac{3 a^{7/4} \sqrt{1-\frac{b x^4}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{5 b^{7/4} \sqrt{a-b x^4}}$$

Result (type 4, 120 leaves):

$$\frac{1}{5 b \sqrt{a-b x^4}}\left(-a x^3+b x^7+\frac{1}{\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2}} 3\, i\, a \sqrt{1-\frac{b x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]-\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\, x\right],-1\right]\right)\right)$$

Problem 846: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{a-b x^4}}\, dx$$

Optimal (type 4, 108 leaves, 6 steps):

$$\frac{a^{3/4} \sqrt{1-\frac{b x^4}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{b^{3/4} \sqrt{a-b x^4}}-\frac{a^{3/4} \sqrt{1-\frac{b x^4}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{b^{3/4} \sqrt{a-b x^4}}$$

Result (type 4, 100 leaves):

$$\left(i \sqrt{1-\frac{b x^4}{a}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x\right], -1\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x\right], -1\right]\right)\right) \Big/ \left(\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2} \sqrt{a-b x^4}\right)$$

Problem 847: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^2 \sqrt{a-b x^4}} \, dx$$

Optimal (type 4, 128 leaves, 7 steps):

$$-\frac{\sqrt{a-b x^4}}{a x} - \frac{b^{1/4} \sqrt{1-\frac{b x^4}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right], -1\right]}{a^{1/4} \sqrt{a-b x^4}} + \frac{b^{1/4} \sqrt{1-\frac{b x^4}{a}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right], -1\right]}{a^{1/4} \sqrt{a-b x^4}}$$

Result (type 4, 115 leaves):

$$\frac{1}{\sqrt{a-b x^4}} \left(-\frac{1}{x} + \frac{b x^3}{a} - i \sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} \sqrt{1-\frac{b x^4}{a}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x\right], -1\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}} x\right], -1\right]\right)\right)$$

Problem 848: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^6 \sqrt{a-b x^4}} \, dx$$

Optimal (type 4, 158 leaves, 8 steps):

$$-\frac{\sqrt{a-b x^4}}{5 a x^5}-\frac{3 b \sqrt{a-b x^4}}{5 a^2 x}-\frac{3 b^{5/4} \sqrt{1-\frac{b x^4}{a}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{5 a^{5/4} \sqrt{a-b x^4}}+\frac{3 b^{5/4} \sqrt{1-\frac{b x^4}{a}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} x}{a^{1/4}}\right],-1\right]}{5 a^{5/4} \sqrt{a-b x^4}}$$

Result (type 4, 131 leaves):

$$\frac{1}{5 a^2 \sqrt{a-b x^4}}\left(\frac{\left(-a+b x^4\right)\left(a+3 b x^4\right)}{x^5}-3 i a \sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\ b \sqrt{1-\frac{b x^4}{a}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]\right)\right)$$

Problem 859: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{12}}{\left(a+b x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 151 leaves, 4 steps):

$$-\frac{x^9}{2 b \sqrt{a+b x^4}}-\frac{15 a x \sqrt{a+b x^4}}{14 b^3}+\frac{9 x^5 \sqrt{a+b x^4}}{14 b^2}+\frac{15 a^{7/4}\left(\sqrt{a}+\sqrt{b}\ x^2\right)\sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b}\ x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{28 b^{13/4} \sqrt{a+b x^4}}$$

Result (type 4, 106 leaves):

$$\frac{-15 a^2 x-6 a b x^5+2 b^2 x^9-\frac{15 i a^2 \sqrt{1+\frac{b x^4}{a}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}\ x\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}}}{14 b^3 \sqrt{a+b x^4}}$$

Problem 860: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^8}{\left(a+b x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 129 leaves, 3 steps):

$$-\frac{x^5}{2 b \sqrt{a+b x^4}}+\frac{5 x \sqrt{a+b x^4}}{6 b^2}-\frac{5 a^{3/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{12 b^{9/4} \sqrt{a+b x^4}}$$

Result (type 4, 93 leaves):

$$\frac{5 a x+2 b x^5+\frac{5 i a \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}}}{6 b^2 \sqrt{a+b x^4}}$$

Problem 861: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 108 leaves, 2 steps):

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

Result (type 4, 102 leaves):

$$-\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x+i \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{2 \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} b \sqrt{a+b x^4}}$$

Problem 862: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 108 leaves, 2 steps):

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

Result (type 4, 102 leaves):

$$\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x-i \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{2 a \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} \sqrt{a+b x^4}}$$

Problem 863: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 131 leaves, 3 steps):

$$\frac{1}{2 a x^3 \sqrt{a+b x^4}}-\frac{5 \sqrt{a+b x^4}}{6 a^2 x^3}-\frac{5 b^{3/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{12 a^{9/4} \sqrt{a+b x^4}}$$

Result (type 4, 93 leaves):

$$\frac{-\frac{2 a}{x^3}-5 b x+\frac{5 i b \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}}}{6 a^2 \sqrt{a+b x^4}}$$

Problem 864: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^8 \left(a+b x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 153 leaves, 4 steps):

$$\frac{1}{2 a x^7 \sqrt{a+b x^4}}-\frac{9 \sqrt{a+b x^4}}{14 a^2 x^7}+\frac{15 b \sqrt{a+b x^4}}{14 a^3 x^3}+$$
$$\frac{15 b^{7/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{28 a^{13/4} \sqrt{a+b x^4}}$$

Result (type 4, 106 leaves):

$$\frac{-\frac{2 a^2}{x^7}+\frac{6 a b}{x^3}+15 b^2 x-\frac{15 i b^2 \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}}}}{14 a^3 \sqrt{a+b x^4}}$$

Problem 865: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{14}}{\left(a+b x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 282 leaves, 6 steps):

$$-\frac{x^{11}}{2\,b\,\sqrt{a+b\,x^4}}-\frac{77\,a\,x^3\,\sqrt{a+b\,x^4}}{90\,b^3}+\frac{11\,x^7\,\sqrt{a+b\,x^4}}{18\,b^2}+\frac{77\,a^2\,x\,\sqrt{a+b\,x^4}}{30\,b^{7/2}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)}-\frac{77\,a^{9/4}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)\,\sqrt{\frac{a+b\,x^4}{\left(\sqrt{a}+\sqrt{b}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{30\,b^{15/4}\,\sqrt{a+b\,x^4}}+\frac{77\,a^{9/4}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)\,\sqrt{\frac{a+b\,x^4}{\left(\sqrt{a}+\sqrt{b}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{60\,b^{15/4}\,\sqrt{a+b\,x^4}}$$

Result (type 4, 183 leaves):

$$\left(\sqrt{\frac{i\,\sqrt{b}}{\sqrt{a}}}\,\sqrt{b}\,x^3\,\left(-77\,a^2-22\,a\,b\,x^4+10\,b^2\,x^8\right)+231\,a^{5/2}\,\sqrt{1+\frac{b\,x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]-231\,a^{5/2}\,\sqrt{1+\frac{b\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]\right)\Big/\left(90\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{a}}}\,b^{7/2}\,\sqrt{a+b\,x^4}\right)$$

Problem 866: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{10}}{\left(a+b\,x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 258 leaves, 5 steps):

$$-\frac{x^7}{2\,b\,\sqrt{a+b\,x^4}}+\frac{7\,x^3\,\sqrt{a+b\,x^4}}{10\,b^2}-\frac{21\,a\,x\,\sqrt{a+b\,x^4}}{10\,b^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)}+\frac{21\,a^{5/4}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)\,\sqrt{\frac{a+b\,x^4}{\left(\sqrt{a}+\sqrt{b}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{10\,b^{11/4}\,\sqrt{a+b\,x^4}}-\frac{21\,a^{5/4}\,\left(\sqrt{a}+\sqrt{b}\,x^2\right)\,\sqrt{\frac{a+b\,x^4}{\left(\sqrt{a}+\sqrt{b}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{20\,b^{11/4}\,\sqrt{a+b\,x^4}}$$

Result (type 4, 172 leaves):

$$\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{b}\,x^3\left(7a+2bx^4\right)-21a^{3/2}\sqrt{1+\frac{bx^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]+21a^{3/2}\sqrt{1+\frac{bx^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]\right)\Big/\left(10\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,b^{5/2}\sqrt{a+bx^4}\right)$$

Problem 867: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^6}{\left(a+bx^4\right)^{3/2}}\,dx$$

Optimal (type 4, 236 leaves, 4 steps):

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

Result (type 4, 163 leaves):

$$\left(-\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{b}\,x^3+3\sqrt{a}\sqrt{1+\frac{bx^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]-3\sqrt{a}\sqrt{1+\frac{bx^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,x\right],-1\right]\right)\Big/\left(2\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,b^{3/2}\sqrt{a+bx^4}\right)$$

Problem 868: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 239 leaves, 4 steps):

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

Result (type 4, 163 leaves):

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

Problem 869: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 260 leaves, 5 steps):

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

Result (type 4, 178 leaves):

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

Problem 870: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^6 \left(a+b x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 282 leaves, 6 steps):

$$\frac{1}{2 a x^5 \sqrt{a+b x^4}}-\frac{7 \sqrt{a+b x^4}}{10 a^2 x^5}+\frac{21 b \sqrt{a+b x^4}}{10 a^3 x}-\frac{21 b^{3/2} x \sqrt{a+b x^4}}{10 a^3 \left(\sqrt{a}+\sqrt{b} x^2\right)}+\frac{21 b^{5/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{10 a^{11/4} \sqrt{a+b x^4}}-\frac{21 b^{5/4} \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{20 a^{11/4} \sqrt{a+b x^4}}$$

Result (type 4, 192 leaves):

$$\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} \left(-2 a^2+14 a b x^4+21 b^2 x^8\right)-21 \sqrt{a} b^{3/2} x^5 \sqrt{1+\frac{b x^4}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]+21 \sqrt{a} b^{3/2} x^5 \sqrt{1+\frac{b x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x\right],-1\right]\right)\Bigg/\left(10 a^3 \sqrt{\frac{i \sqrt{b}}{\sqrt{a}}} x^5 \sqrt{a+b x^4}\right)$$

Problem 871: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^4\right)^{5/2}} \, dx$$

Optimal (type 4, 127 leaves, 3 steps):

$$\frac{x}{6 a \left(a+b x^4\right)^{3/2}}+\frac{5 x}{12 a^2 \sqrt{a+b x^4}}+\frac{5 \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{24 a^{9/4} b^{1/4} \sqrt{a+b x^4}}$$

Result (type 4, 99 leaves):

$$\frac{7\,a\,x+5\,b\,x^5-\frac{5\,\mathrm{i}\,\left(a+b\,x^4\right)\,\sqrt{1+\frac{b\,x^4}{a}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}}\;x\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}}}}{12\,a^2\,\left(a+b\,x^4\right)^{3/2}}$$

Problem 925: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^8}{\sqrt{1+x^4}}\,dx$$

Optimal (type 4, 74 leaves, 3 steps):

$$-\frac{5}{21}\,x\,\sqrt{1+x^4}+\frac{1}{7}\,x^5\,\sqrt{1+x^4}+\frac{5\,\left(1+x^2\right)\,\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{42\,\sqrt{1+x^4}}$$

Result (type 4, 57 leaves):

$$-\frac{1}{21\,\sqrt{1+x^4}}\left(5\,x+2\,x^5-3\,x^9+5\,(-1)^{1/4}\,\sqrt{1+x^4}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 926: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 58 leaves, 2 steps):

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

Result (type 4, 47 leaves):

$$\frac{x+x^5+(-1)^{1/4}\,\sqrt{1+x^4}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]}{3\,\sqrt{1+x^4}}$$

Problem 927: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 43 leaves, 1 step):

$$\frac{\left(1+x^2\right)\,\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{2\,\sqrt{1+x^4}}$$

Result (type 4, 21 leaves):

$$-(-1)^{1/4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]$$

Problem 928: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 60 leaves, 2 steps):

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

Result (type 4, 55 leaves):

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

Problem 929: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^8\sqrt{1+x^4}}\,dx$$

Optimal (type 4, 76 leaves, 3 steps):

$$-\frac{\sqrt{1+x^4}}{7\,x^7}+\frac{5\sqrt{1+x^4}}{21\,x^3}+\frac{5\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{42\sqrt{1+x^4}}$$

Result (type 4, 61 leaves):

$$\frac{1}{21\,x^7\sqrt{1+x^4}}\left(-3+2\,x^4+5\,x^8-5\,(-1)^{1/4}\,x^7\sqrt{1+x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 930: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{10}}{\sqrt{1+x^4}}\,dx$$

Optimal (type 4, 140 leaves, 5 steps):

$$-\frac{7}{45}\,x^3\sqrt{1+x^4}+\frac{1}{9}\,x^7\sqrt{1+x^4}+\frac{7\,x\sqrt{1+x^4}}{15\left(1+x^2\right)}-$$

$$\frac{7\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{15\sqrt{1+x^4}}+\frac{7\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{30\sqrt{1+x^4}}$$

Result (type 4, 72 leaves) :

$$\frac{1}{45}\left(\frac{x^3\left(-7-2x^4+5x^8\right)}{\sqrt{1+x^4}}-21(-1)^{3/4}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]+21(-1)^{3/4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 931: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^6}{\sqrt{1+x^4}}\,dx$$

Optimal (type 4, 124 leaves, 4 steps) :

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

Result (type 4, 73 leaves) :

$$\frac{1}{5}\left(3(-1)^{3/4}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]+\frac{x^3+x^7-3(-1)^{3/4}\sqrt{1+x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]}{\sqrt{1+x^4}}\right)$$

Problem 932: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2}{\sqrt{1+x^4}}\,dx$$

Optimal (type 4, 103 leaves, 3 steps) :

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

Result (type 4, 37 leaves) :

$$(-1)^{3/4}\left(-\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]+\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 933: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^2 \sqrt{1+x^4}} \, dx$$

Optimal (type 4, 117 leaves, 4 steps):

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

Result (type 4, 70 leaves):

$$-\frac{1}{x\sqrt{1+x^4}}-\frac{x^3}{\sqrt{1+x^4}}-(-1)^{3/4}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]+(-1)^{3/4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]$$

Problem 934: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^6 \sqrt{1+x^4}} \, dx$$

Optimal (type 4, 140 leaves, 5 steps):

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

Result (type 4, 94 leaves):

$$\frac{1}{5x^5\sqrt{1+x^4}}\left(-1+2x^4+3x^8+3(-1)^{3/4}x^5\sqrt{1+x^4}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]-3(-1)^{3/4}x^5\sqrt{1+x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 945: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{12}}{\left(1+x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 90 leaves, 4 steps):

$$-\frac{x^9}{2\sqrt{1+x^4}}-\frac{15}{14}x\sqrt{1+x^4}+\frac{9}{14}x^5\sqrt{1+x^4}+\frac{15\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{28\sqrt{1+x^4}}$$

Result (type 4, 57 leaves):

$$-\frac{1}{14\sqrt{1+x^4}}\left(15\,x+6\,x^5-2\,x^9+15\,(-1)^{1/4}\sqrt{1+x^4}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 946: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^8}{\left(1+x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 74 leaves, 3 steps):

$$-\frac{x^5}{2\sqrt{1+x^4}}+\frac{5}{6}x\sqrt{1+x^4}-\frac{5\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{12\sqrt{1+x^4}}$$

Result (type 4, 52 leaves):

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

Problem 947: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 58 leaves, 2 steps):

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

Result (type 4, 38 leaves):

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

Problem 948: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 58 leaves, 2 steps):

$$\frac{x}{2\sqrt{1+x^4}}+\frac{\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{4\sqrt{1+x^4}}$$

Result (type 4, 37 leaves):

$$\frac{1}{2}\left(\frac{x}{\sqrt{1+x^4}}-(-1)^{1/4}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 949: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 76 leaves, 3 steps):

$$\frac{1}{2x^3\sqrt{1+x^4}}-\frac{5\sqrt{1+x^4}}{6x^3}-\frac{5\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{12\sqrt{1+x^4}}$$

Result (type 4, 46 leaves):

$$\frac{1}{6}\left(\frac{-2-5x^4}{x^3\sqrt{1+x^4}}+5\,(-1)^{1/4}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 950: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^8\left(1+x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 92 leaves, 4 steps):

$$\frac{1}{2x^7\sqrt{1+x^4}}-\frac{9\sqrt{1+x^4}}{14x^7}+\frac{15\sqrt{1+x^4}}{14x^3}+\frac{15\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{28\sqrt{1+x^4}}$$

Result (type 4, 61 leaves):

$$\frac{1}{14x^7\sqrt{1+x^4}}\left(-2+6x^4+15x^8-15\,(-1)^{1/4}\,x^7\sqrt{1+x^4}\ \text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 951: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{14}}{\left(1+x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 156 leaves, 6 steps):

$$-\frac{x^{11}}{2\sqrt{1+x^4}}-\frac{77}{90}x^3\sqrt{1+x^4}+\frac{11}{18}x^7\sqrt{1+x^4}+\frac{77x\sqrt{1+x^4}}{30\left(1+x^2\right)}-\frac{77\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{30\sqrt{1+x^4}}+\frac{77\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{60\sqrt{1+x^4}}$$

Result (type 4, 72 leaves):

$$\frac{1}{90}\left(\frac{x^3\left(-77-22x^4+10x^8\right)}{\sqrt{1+x^4}}-231\,(-1)^{3/4}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]+231\,(-1)^{3/4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 952: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{10}}{\left(1+x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 140 leaves, 5 steps):

$$-\frac{x^7}{2\sqrt{1+x^4}}+\frac{7}{10}x^3\sqrt{1+x^4}-\frac{21x\sqrt{1+x^4}}{10\left(1+x^2\right)}+\frac{21\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{10\sqrt{1+x^4}}-\frac{21\left(1+x^2\right)\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{20\sqrt{1+x^4}}$$

Result (type 4, 75 leaves):

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

Problem 953: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 124 leaves, 4 steps):

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

Result (type 4, 61 leaves):

$$\frac{1}{2}\left(-\frac{x^3}{\sqrt{1+x^4}}-3\,(-1)^{3/4}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]+\right.$$
$$\left.3\,(-1)^{3/4}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 954: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 124 leaves, 4 steps):

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

Result (type 4, 59 leaves):

$$\frac{1}{2}\left(\frac{x^3}{\sqrt{1+x^4}}+(-1)^{3/4}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]-\right.$$
$$\left.(-1)^{3/4}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]\right)$$

Problem 955: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 140 leaves, 5 steps):

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

Result (type 4, 75 leaves):

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

Problem 956: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 6 steps):

$$\frac{1}{2 x^5 \sqrt{1+x^4}}-\frac{7 \sqrt{1+x^4}}{10 x^5}+\frac{21 \sqrt{1+x^4}}{10 x}-$$
$$\frac{21 x \sqrt{1+x^4}}{10 \left(1+x^2\right)}+\frac{21 \left(1+x^2\right) \sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}[x],\frac{1}{2}\right]}{10 \sqrt{1+x^4}}-$$
$$\frac{21 \left(1+x^2\right) \sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}[x],\frac{1}{2}\right]}{20 \sqrt{1+x^4}}$$

Result (type 4, 94 leaves):

$$\frac{1}{10 x^5 \sqrt{1+x^4}}\left(-2+14 x^4+21 x^8+21 (-1)^{3/4} x^5 \sqrt{1+x^4}\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[(-1)^{1/4} x\right],-1\right]-\right.$$
$$\left.21 (-1)^{3/4} x^5 \sqrt{1+x^4}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[(-1)^{1/4} x\right],-1\right]\right)$$

Problem 957: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(1+x^4\right)^{5/2}}\, dx$$

Optimal (type 4, 72 leaves, 3 steps):

$$\frac{x}{6\left(1+x^4\right)^{3/2}}+\frac{5\,x}{12\,\sqrt{1+x^4}}+\frac{5\,\left(1+x^2\right)\,\sqrt{\frac{1+x^4}{\left(1+x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}[x],\frac{1}{2}\right]}{24\,\sqrt{1+x^4}}$$

Result (type 4, 52 leaves):

$$\frac{7\,x+5\,x^5-5\,(-1)^{1/4}\,\left(1+x^4\right)^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]}{12\,\left(1+x^4\right)^{3/2}}$$

Problem 972: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 18 leaves, 3 steps):

$$\frac{1}{2}\,\text{ArcTanh}\left[\frac{x^2}{\sqrt{-4+x^4}}\right]$$

Result (type 3, 42 leaves):

$$-\frac{1}{4}\,\text{Log}\left[1-\frac{x^2}{\sqrt{-4+x^4}}\right]+\frac{1}{4}\,\text{Log}\left[1+\frac{x^2}{\sqrt{-4+x^4}}\right]$$

Problem 982: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 54 leaves, 4 steps):

$$\frac{3^{1/4}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{3^{1/4}}\right],-1\right]}{b^{3/4}}-\frac{3^{1/4}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,x}{3^{1/4}}\right],-1\right]}{b^{3/4}}$$

Result (type 4, 76 leaves):

$$\frac{1}{b}\,\mathrm{i}\,3^{1/4}\,\sqrt{-\sqrt{b}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b}}\,x}{3^{1/4}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b}}\,x}{3^{1/4}}\right],-1\right]\right)$$

Problem 991: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 66 leaves, 6 steps):

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

Result (type 5, 61 leaves):

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

Problem 992: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^5}\,dx$$

Optimal (type 3, 75 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{4 x^4}-\frac{b\,\text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{3/4}}-\frac{b\,\text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{3/4}}$$

Result (type 5, 67 leaves):

$$\frac{-3\left(a+b x^4\right)-b\left(1+\frac{a}{b x^4}\right)^{3/4} x^4\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{a}{b x^4}\right]}{12 x^4\left(a+b x^4\right)^{3/4}}$$

Problem 993: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^9}\,dx$$

Optimal (type 3, 101 leaves, 7 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{8 x^8}-\frac{b\left(a+b x^4\right)^{1/4}}{32 a x^4}+\frac{3 b^2\,\text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{7/4}}+\frac{3 b^2\,\text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{7/4}}$$

Result (type 5, 82 leaves):

$$\left(-4 a^2-5 a b x^4-b^2 x^8+b^2\left(1+\frac{a}{b x^4}\right)^{3/4} x^8\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{a}{b x^4}\right]\right)\Big/\left(32 a x^8\left(a+b x^4\right)^{3/4}\right)$$

Problem 994: Result unnecessarily involves higher level functions.

$$\int x^9\left(a+b x^4\right)^{1/4}\,dx$$

Optimal (type 4, 125 leaves, 6 steps):

$$-\frac{2 a^2 x^2\left(a+b x^4\right)^{1/4}}{77 b^2}+\frac{a x^6\left(a+b x^4\right)^{1/4}}{77 b}+\frac{1}{11} x^{10}\left(a+b x^4\right)^{1/4}+\frac{4 a^{7/2}\left(1+\frac{b x^4}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{77 b^{5/2}\left(a+b x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{77\,b^2\left(a+b\,x^4\right)^{3/4}}\,x^2\left(-2\,a^3-a^2\,b\,x^4+8\,a\,b^2\,x^8+7\,b^3\,x^{12}+2\,a^3\left(1+\frac{b\,x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^4}{a}\right]\right)$$

Problem 995: Result unnecessarily involves higher level functions.

$$\int x^5\left(a+b\,x^4\right)^{1/4}\,dx$$

Optimal (type 4, 101 leaves, 5 steps):

$$\frac{a\,x^2\left(a+b\,x^4\right)^{1/4}}{21\,b}+\frac{1}{7}\,x^6\left(a+b\,x^4\right)^{1/4}-\frac{2\,a^{5/2}\left(1+\frac{b\,x^4}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{21\,b^{3/2}\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 78 leaves):

$$\frac{1}{21\,b\left(a+b\,x^4\right)^{3/4}}x^2\left(a^2+4\,a\,b\,x^4+3\,b^2\,x^8-a^2\left(1+\frac{b\,x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^4}{a}\right]\right)$$

Problem 996: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 63 leaves):

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

Problem 997: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 66 leaves):

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

Problem 998: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^7}\,dx$$

Optimal (type 4, 101 leaves, 5 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{6 x^6}-\frac{b\left(a+b x^4\right)^{1/4}}{12 a x^2}-\frac{b^{3/2}\left(1+\frac{b x^4}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{12\sqrt{a}\left(a+b x^4\right)^{3/4}}$$

Result (type 5, 85 leaves):

$$\left(-2\left(2 a^2+3 a b x^4+b^2 x^8\right)-b^2 x^8\left(1+\frac{b x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/\left(24 a x^6\left(a+b x^4\right)^{3/4}\right)$$

Problem 999: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^{11}}\,dx$$

Optimal (type 4, 125 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{10 x^{10}}-\frac{b\left(a+b x^4\right)^{1/4}}{60 a x^6}+\frac{b^2\left(a+b x^4\right)^{1/4}}{24 a^2 x^2}+\frac{b^{5/2}\left(1+\frac{b x^4}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{24 a^{3/2}\left(a+b x^4\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\left(-24 a^3-28 a^2 b x^4+6 a b^2 x^8+10 b^3 x^{12}+5 b^3 x^{12}\left(1+\frac{b x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/\left(240 a^2 x^{10}\left(a+b x^4\right)^{3/4}\right)$$

Problem 1000: Result unnecessarily involves higher level functions.

$$\int x^6\left(a+b x^4\right)^{1/4}\,dx$$

Optimal (type 3, 103 leaves, 6 steps):

$$\frac{a x^3\left(a+b x^4\right)^{1/4}}{32 b}+\frac{1}{8}x^7\left(a+b x^4\right)^{1/4}+\frac{3 a^2\,\text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{7/4}}-\frac{3 a^2\,\text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{7/4}}$$

Result (type 5, 78 leaves):

$$\frac{1}{32\,b\,\left(a+b\,x^4\right)^{3/4}}x^3\,\left(a^2+5\,a\,b\,x^4+4\,b^2\,x^8-a^2\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^4}{a}\right]\right)$$

Problem 1001: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 77 leaves, 5 steps):

$$\frac{1}{4}\,x^3\,\left(a+b\,x^4\right)^{1/4}-\frac{a\,\text{ArcTan}\left[\frac{b^{1/4}\,x}{\left(a+b\,x^4\right)^{1/4}}\right]}{8\,b^{3/4}}+\frac{a\,\text{ArcTanh}\left[\frac{b^{1/4}\,x}{\left(a+b\,x^4\right)^{1/4}}\right]}{8\,b^{3/4}}$$

Result (type 5, 63 leaves):

$$\frac{x^3\,\left(3\,\left(a+b\,x^4\right)+a\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^4}{a}\right]\right)}{12\,\left(a+b\,x^4\right)^{3/4}}$$

Problem 1002: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 73 leaves, 5 steps):

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

Result (type 5, 66 leaves):

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

Problem 1007: Result unnecessarily involves higher level functions.

$$\int x^{12}\,\left(a+b\,x^4\right)^{1/4}\,dx$$

Optimal (type 4, 150 leaves, 8 steps):

$$\frac{3\,a^3\,x\,\left(a+b\,x^4\right)^{1/4}}{112\,b^3}-\frac{3\,a^2\,x^5\,\left(a+b\,x^4\right)^{1/4}}{280\,b^2}+\frac{a\,x^9\,\left(a+b\,x^4\right)^{1/4}}{140\,b}+$$
$$\frac{1}{14}\,x^{13}\,\left(a+b\,x^4\right)^{1/4}+\frac{3\,a^{7/2}\,\left(1+\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{112\,b^{5/2}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 101 leaves):

$$\left(15 a^4 x + 9 a^3 b x^5 - 2 a^2 b^2 x^9 + 44 a b^3 x^{13} + 40 b^4 x^{17} - 15 a^4 x \left(1 + \frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^4}{a}\right]\right) \Big/ \left(560 b^3 \left(a + b x^4\right)^{3/4}\right)$$

Problem 1008: Result unnecessarily involves higher level functions.

$$\int x^8 \left(a + b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 126 leaves, 7 steps):

$$-\frac{a^2 x \left(a + b x^4\right)^{1/4}}{24 b^2} + \frac{a x^5 \left(a + b x^4\right)^{1/4}}{60 b} + \frac{1}{10} x^9 \left(a + b x^4\right)^{1/4} - \frac{a^{5/2} \left(1 + \frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right], 2\right]}{24 b^{3/2} \left(a + b x^4\right)^{3/4}}$$

Result (type 5, 90 leaves):

$$\left(-5 a^3 x - 3 a^2 b x^5 + 14 a b^2 x^9 + 12 b^3 x^{13} + 5 a^3 x \left(1 + \frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^4}{a}\right]\right) \Big/ \left(120 b^2 \left(a + b x^4\right)^{3/4}\right)$$

Problem 1009: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 102 leaves, 6 steps):

$$\frac{a x \left(a + b x^4\right)^{1/4}}{12 b} + \frac{1}{6} x^5 \left(a + b x^4\right)^{1/4} + \frac{a^{3/2} \left(1 + \frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right], 2\right]}{12 \sqrt{b} \left(a + b x^4\right)^{3/4}}$$

Result (type 5, 76 leaves):

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

Problem 1010: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 80 leaves, 5 steps):

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

Result (type 5, 58 leaves):

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

Problem 1011: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 66 leaves):

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

Problem 1012: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^8} \, dx$$

Optimal (type 4, 104 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{7 x^7}-\frac{b \left(a+b x^4\right)^{1/4}}{21 a x^3}+\frac{2 b^{5/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{21 a^{3/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 83 leaves):

$$\left(-3 a^2-4 a b x^4-b^2 x^8-2 b^2 x^8 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right) \Big/ \left(21 a x^7 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1013: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^{12}} \, dx$$

Optimal (type 4, 128 leaves, 7 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{11 x^{11}}-\frac{b \left(a+b x^4\right)^{1/4}}{77 a x^7}+\frac{2 b^2 \left(a+b x^4\right)^{1/4}}{77 a^2 x^3}-\frac{4 b^{7/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{77 a^{5/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 93 leaves):

$$\left(-7 a^3-8 a^2 b x^4+a b^2 x^8+2 b^3 x^{12}+4 b^3 x^{12} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)\Big/\left(77 a^2 x^{11} \left(a+b x^4\right)^{3/4}\right)$$

Problem 1014: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{1/4}}{x^{16}} \, dx$$

Optimal (type 4, 152 leaves, 8 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{15 x^{15}}-\frac{b \left(a+b x^4\right)^{1/4}}{165 a x^{11}}+\frac{2 b^2 \left(a+b x^4\right)^{1/4}}{231 a^2 x^7}-\frac{4 b^3 \left(a+b x^4\right)^{1/4}}{231 a^3 x^3}+\frac{8 b^{9/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{231 a^{7/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 105 leaves):

$$\left(-77 a^4-84 a^3 b x^4+3 a^2 b^2 x^8-10 a b^3 x^{12}-20 b^4 x^{16}-40 b^4 x^{16} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)\Big/\left(1155 a^3 x^{15} \left(a+b x^4\right)^{3/4}\right)$$

Problem 1020: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 70 leaves, 6 steps):

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

Result (type 5, 58 leaves):

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

Problem 1021: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{3/4}}{x^5}\,dx$$

Optimal (type 3, 75 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{3/4}}{4 x^4}+\frac{3 b \,\text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{1/4}}-\frac{3 b \,\text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{1/4}}$$

Result (type 5, 67 leaves):

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

Problem 1022: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{3/4}}{x^9}\,dx$$

Optimal (type 3, 101 leaves, 7 steps):

$$-\frac{\left(a+b x^4\right)^{3/4}}{8 x^8}-\frac{3 b \left(a+b x^4\right)^{3/4}}{32 a x^4}-\frac{3 b^2 \,\text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{5/4}}+\frac{3 b^2 \,\text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{5/4}}$$

Result (type 5, 83 leaves):

$$\left(-4 a^2-7 a b x^4-3 b^2 x^8+3 b^2 \left(1+\frac{a}{b x^4}\right)^{1/4} x^8 \,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{a}{b x^4}\right]\right) \Big/ \left(32 a x^8 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1023: Result unnecessarily involves higher level functions.

$$\int x^9 \left(a+b x^4\right)^{3/4}\,dx$$

Optimal (type 4, 149 leaves, 7 steps):

$$\frac{4 a^3 x^2}{65 b^2 \left(a+b x^4\right)^{1/4}}-\frac{2 a^2 x^2 \left(a+b x^4\right)^{3/4}}{65 b^2}+\frac{a x^6 \left(a+b x^4\right)^{3/4}}{39 b}+\frac{1}{13} x^{10} \left(a+b x^4\right)^{3/4}-\frac{4 a^{7/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{65 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 91 leaves):

$$\left(x^2 \left(-6 a^3 - a^2 b x^4 + 20 a b^2 x^8 + 15 b^3 x^{12} + 6 a^3 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^4}{a}\right]\right)\right) \Big/ \left(195 b^2 \left(a + b x^4\right)^{1/4}\right)$$

Problem 1024: Result unnecessarily involves higher level functions.

$$\int x^5 \left(a + b x^4\right)^{3/4} dx$$

Optimal (type 4, 125 leaves, 6 steps):

$$-\frac{2 a^2 x^2}{15 b \left(a + b x^4\right)^{1/4}} + \frac{a x^2 \left(a + b x^4\right)^{3/4}}{15 b} + \frac{1}{9} x^6 \left(a + b x^4\right)^{3/4} + \frac{2 a^{5/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right], 2\right]}{15 b^{3/2} \left(a + b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{45 b \left(a + b x^4\right)^{1/4}} x^2 \left(3 a^2 + 8 a b x^4 + 5 b^2 x^8 - 3 a^2 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^4}{a}\right]\right)$$

Problem 1025: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 98 leaves, 5 steps):

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

Result (type 5, 64 leaves):

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

Problem 1026: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 98 leaves, 5 steps):

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

Result (type 5, 67 leaves):

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

Problem 1027: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b x^4\right)^{3/4}}{x^7}\,dx$$

Optimal (type 4, 125 leaves, 6 steps):

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

Result (type 5, 86 leaves):

$$\left(-2\left(2 a^2+5 a b x^4+3 b^2 x^8\right)+3 b^2 x^8\left(1+\frac{b x^4}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/\left(24 a x^6\left(a+b x^4\right)^{1/4}\right)$$

Problem 1028: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b x^4\right)^{3/4}}{x^{11}}\,dx$$

Optimal (type 4, 149 leaves, 7 steps):

$$-\frac{3 b^3 x^2}{40 a^2\left(a+b x^4\right)^{1/4}}-\frac{\left(a+b x^4\right)^{3/4}}{10 x^{10}}-\frac{b\left(a+b x^4\right)^{3/4}}{20 a x^6}+\frac{3 b^2\left(a+b x^4\right)^{3/4}}{40 a^2 x^2}+\frac{3 b^{5/2}\left(1+\frac{b x^4}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{40 a^{3/2}\left(a+b x^4\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\left(-8 a^3-12 a^2 b x^4+2 a b^2 x^8+6 b^3 x^{12}-3 b^3 x^{12}\left(1+\frac{b x^4}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/\left(80 a^2 x^{10}\left(a+b x^4\right)^{1/4}\right)$$

Problem 1038: Result unnecessarily involves higher level functions.

$$\int x^{10}\left(a+b x^4\right)^{3/4}\,dx$$

Optimal (type 4, 150 leaves, 8 steps):

$$\frac{3 a^3 x^3}{80 b^2 \left(a+b x^4\right)^{1/4}}-\frac{a^2 x^3 \left(a+b x^4\right)^{3/4}}{40 b^2}+\frac{3 a x^7 \left(a+b x^4\right)^{3/4}}{140 b}+\frac{1}{14} x^{11} \left(a+b x^4\right)^{3/4}+\frac{3 a^{7/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{80 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 91 leaves):

$$\left(x^3 \left(-7 a^3-a^2 b x^4+26 a b^2 x^8+20 b^3 x^{12}+7 a^3 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)\right)\Big/\left(280 b^2 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1039: Result unnecessarily involves higher level functions.

$$\int x^6 \left(a+b x^4\right)^{3/4} \, dx$$

Optimal (type 4, 126 leaves, 7 steps):

$$-\frac{3 a^2 x^3}{40 b \left(a+b x^4\right)^{1/4}}+\frac{a x^3 \left(a+b x^4\right)^{3/4}}{20 b}+\frac{1}{10} x^7 \left(a+b x^4\right)^{3/4}-\frac{3 a^{5/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{40 b^{3/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 78 leaves):

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

Problem 1040: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 99 leaves, 6 steps):

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

Result (type 5, 60 leaves):

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

Problem 1041: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 97 leaves, 6 steps):

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

Result (type 5, 63 leaves):

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

Problem 1042: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{3/4}}{x^6}\,dx$$

Optimal (type 4, 99 leaves, 6 steps):

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

Result (type 5, 83 leaves):

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

Problem 1043: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{3/4}}{x^{10}}\,dx$$

Optimal (type 4, 126 leaves, 7 steps):

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

Result (type 5, 94 leaves):

$$\left(-5 a^3-8 a^2 b x^4+3 a b^2 x^8+6 b^3 x^{12}-4 b^3 x^{12} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)\Big/ \left(45 a^2 x^9 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1044: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{3/4}}{x^{14}} \, dx$$

Optimal (type 4, 150 leaves, 8 steps):

$$-\frac{4 b^3}{65 a^2 x \left(a+b x^4\right)^{1/4}}-\frac{\left(a+b x^4\right)^{3/4}}{13 x^{13}}-\frac{b \left(a+b x^4\right)^{3/4}}{39 a x^9}+\frac{2 b^2 \left(a+b x^4\right)^{3/4}}{65 a^2 x^5}+\frac{4 b^{7/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{65 a^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 104 leaves):

$$\left(-15 a^4-20 a^3 b x^4+a^2 b^2 x^8-6 a b^3 x^{12}-12 b^4 x^{16}+8 b^4 x^{16} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)\Big/ \left(195 a^3 x^{13} \left(a+b x^4\right)^{1/4}\right)$$

Problem 1050: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x} \, dx$$

Optimal (type 3, 83 leaves, 7 steps):

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

Result (type 5, 76 leaves):

$$\frac{1}{15 \left(a+b x^4\right)^{3/4}}\left(3 \left(6 a^2+7 a b x^4+b^2 x^8\right)-5 a^2 \left(1+\frac{a}{b x^4}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{a}{b x^4}\right]\right)$$

Problem 1051: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^5} \, dx$$

Optimal (type 3, 91 leaves, 7 steps):

$$\frac{5}{4} b \left(a+b x^4\right)^{1/4}-\frac{\left(a+b x^4\right)^{5/4}}{4 x^4}-\frac{5}{8} a^{1/4} b \,\text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]-\frac{5}{8} a^{1/4} b \,\text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]$$

Result (type 5, 73 leaves):

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

Problem 1052: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^9} \, dx$$

Optimal (type 3, 98 leaves, 7 steps):

$$-\frac{5 b \left(a+b x^4\right)^{1/4}}{32 x^4}-\frac{\left(a+b x^4\right)^{5/4}}{8 x^8}-\frac{5 b^2 \text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{3/4}}-\frac{5 b^2 \text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{3/4}}$$

Result (type 5, 85 leaves):

$$\left(-\frac{a}{8 x^8}-\frac{9 b}{32 x^4}\right) \left(a+b x^4\right)^{1/4}-\frac{5 b^2 \left(\frac{a+b x^4}{b x^4}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{a}{b x^4}\right]}{96 \left(a+b x^4\right)^{3/4}}$$

Problem 1053: Result unnecessarily involves higher level functions.

$$\int x^9 \left(a+b x^4\right)^{5/4} \, dx$$

Optimal (type 4, 146 leaves, 7 steps):

$$-\frac{2 a^3 x^2 \left(a+b x^4\right)^{1/4}}{231 b^2}+\frac{a^2 x^6 \left(a+b x^4\right)^{1/4}}{231 b}+\frac{1}{33} a x^{10} \left(a+b x^4\right)^{1/4}+$$
$$\frac{1}{15} x^{10} \left(a+b x^4\right)^{5/4}+\frac{4 a^{9/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{231 b^{5/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 102 leaves):

$$\left(x^2 \left(-10 a^4-5 a^3 b x^4+117 a^2 b^2 x^8+189 a b^3 x^{12}+77 b^4 x^{16}+\right.\right.$$
$$\left.\left.10 a^4 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\right) \Big/ \left(1155 b^2 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1054: Result unnecessarily involves higher level functions.

$$\int x^5 \left(a+b x^4\right)^{5/4} \, dx$$

Optimal (type 4, 122 leaves, 6 steps):

$$\frac{5 a^2 x^2 \left(a+b x^4\right)^{1/4}}{231 b}+\frac{5}{77} a x^6 \left(a+b x^4\right)^{1/4}+\frac{1}{11} x^6 \left(a+b x^4\right)^{5/4}-\frac{10 a^{7/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{231 b^{3/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{231 b \left(a+b x^4\right)^{3/4}} x^2 \left(5 a^3+41 a^2 b x^4+57 a b^2 x^8+21 b^3 x^{12}-5 a^3 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1055: Result unnecessarily involves higher level functions.

$$\int x \left(a+b x^4\right)^{5/4} \, dx$$

Optimal (type 4, 98 leaves, 5 steps):

$$\frac{5}{21} a x^2 \left(a+b x^4\right)^{1/4}+\frac{1}{7} x^2 \left(a+b x^4\right)^{5/4}+\frac{5 a^{5/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{21 \sqrt{b} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{1}{42 \left(a+b x^4\right)^{3/4}} x^2 \left(16 a^2+22 a b x^4+6 b^2 x^8+5 a^2 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1056: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^3} \, dx$$

Optimal (type 4, 98 leaves, 5 steps):

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

Result (type 5, 79 leaves):

$$\frac{1}{12 x^2 \left(a+b x^4\right)^{3/4}} \left(-6 a^2-2 a b x^4+4 b^2 x^8+5 a b x^4 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1057: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b\,x^4\right)^{5/4}}{x^7}\,dx$$

Optimal (type 4, 98 leaves, 5 steps):

$$-\frac{5\,b\,\left(a+b\,x^4\right)^{1/4}}{12\,x^2}-\frac{\left(a+b\,x^4\right)^{5/4}}{6\,x^6}+\frac{5\,\sqrt{a}\,b^{3/2}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{12\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 85 leaves):

$$\left(-\frac{a}{6\,x^6}-\frac{7\,b}{12\,x^2}\right)\,\left(a+b\,x^4\right)^{1/4}+\frac{5\,b^2\,x^2\,\left(\frac{a+b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^4}{a}\right]}{24\,\left(a+b\,x^4\right)^{3/4}}$$

Problem 1058: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b\,x^4\right)^{5/4}}{x^{11}}\,dx$$

Optimal (type 4, 122 leaves, 6 steps):

$$-\frac{b\,\left(a+b\,x^4\right)^{1/4}}{12\,x^6}-\frac{b^2\,\left(a+b\,x^4\right)^{1/4}}{24\,a\,x^2}-\frac{\left(a+b\,x^4\right)^{5/4}}{10\,x^{10}}-\frac{b^{5/2}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{24\,\sqrt{a}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 97 leaves):

$$\left(-2\,\left(12\,a^3+34\,a^2\,b\,x^4+27\,a\,b^2\,x^8+5\,b^3\,x^{12}\right)-5\,b^3\,x^{12}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^4}{a}\right]\right)\Big/\left(240\,a\,x^{10}\,\left(a+b\,x^4\right)^{3/4}\right)$$

Problem 1059: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b\,x^4\right)^{5/4}}{x^{15}}\,dx$$

Optimal (type 4, 146 leaves, 7 steps):

$$-\frac{b\,\left(a+b\,x^4\right)^{1/4}}{28\,x^{10}}-\frac{b^2\,\left(a+b\,x^4\right)^{1/4}}{168\,a\,x^6}+\frac{5\,b^3\,\left(a+b\,x^4\right)^{1/4}}{336\,a^2\,x^2}-\frac{\left(a+b\,x^4\right)^{5/4}}{14\,x^{14}}+\frac{5\,b^{7/2}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{336\,a^{3/2}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 105 leaves):

$$\left(-48 a^4-120 a^3 b x^4-76 a^2 b^2 x^8+6 a b^3 x^{12}+10 b^4 x^{16}+5 b^4 x^{16} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right) \Big/ \left(672 a^2 x^{14} \left(a+b x^4\right)^{3/4}\right)$$

Problem 1060: Result unnecessarily involves higher level functions.

$$\int x^{10} \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 3, 148 leaves, 8 steps):

$$-\frac{35 a^3 x^3 \left(a+b x^4\right)^{1/4}}{6144 b^2}+\frac{5 a^2 x^7 \left(a+b x^4\right)^{1/4}}{1536 b}+\frac{5}{192} a x^{11} \left(a+b x^4\right)^{1/4}+\frac{1}{16} x^{11} \left(a+b x^4\right)^{5/4}-\frac{35 a^4 \text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{4096 b^{11/4}}+\frac{35 a^4 \text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{4096 b^{11/4}}$$

Result (type 5, 102 leaves):

$$\left(x^3 \left(-35 a^4-15 a^3 b x^4+564 a^2 b^2 x^8+928 a b^3 x^{12}+384 b^4 x^{16}+35 a^4 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)\right) \Big/ \left(6144 b^2 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1061: Result unnecessarily involves higher level functions.

$$\int x^6 \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 3, 124 leaves, 7 steps):

$$\frac{5 a^2 x^3 \left(a+b x^4\right)^{1/4}}{384 b}+\frac{5}{96} a x^7 \left(a+b x^4\right)^{1/4}+\frac{1}{12} x^7 \left(a+b x^4\right)^{5/4}+\frac{5 a^3 \text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{256 b^{7/4}}-\frac{5 a^3 \text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{256 b^{7/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{384 b \left(a+b x^4\right)^{3/4}} x^3 \left(5 a^3+57 a^2 b x^4+84 a b^2 x^8+32 b^3 x^{12}-5 a^3 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1062: Result unnecessarily involves higher level functions.

$$\int x^2 \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 3, 100 leaves, 6 steps):

$$\frac{5}{32} a x^3 \left(a+b x^4\right)^{1/4}+\frac{1}{8} x^3 \left(a+b x^4\right)^{5/4}-\frac{5 a^2 \text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{3/4}}+\frac{5 a^2 \text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{1}{96 \left(a+b x^4\right)^{3/4}} x^3 \left(27 a^2+39 a b x^4+12 b^2 x^8+5 a^2 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1063: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^2} \, dx$$

Optimal (type 3, 94 leaves, 6 steps):

$$\frac{5}{4} b x^3 \left(a+b x^4\right)^{1/4}-\frac{\left(a+b x^4\right)^{5/4}}{x}-\frac{5}{8} a b^{1/4} \text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]+\frac{5}{8} a b^{1/4} \text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]$$

Result (type 5, 79 leaves):

$$\frac{1}{12 x \left(a+b x^4\right)^{3/4}} \left(-12 a^2-9 a b x^4+3 b^2 x^8+5 a b x^4 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1064: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^6} \, dx$$

Optimal (type 3, 92 leaves, 6 steps):

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

Result (type 5, 81 leaves):

$$\frac{1}{15 x^5 \left(a+b x^4\right)^{3/4}} \left(-3 \left(a^2+7 a b x^4+6 b^2 x^8\right)+5 b^2 x^8 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1069: Result unnecessarily involves higher level functions.

$$\int x^{12} \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 4, 171 leaves, 9 steps):

$$\frac{5 a^4 x \left(a+b x^4\right)^{1/4}}{672 b^3}-\frac{a^3 x^5 \left(a+b x^4\right)^{1/4}}{336 b^2}+\frac{a^2 x^9 \left(a+b x^4\right)^{1/4}}{504 b}+\frac{5}{252} a x^{13} \left(a+b x^4\right)^{1/4}+\frac{1}{18} x^{13} \left(a+b x^4\right)^{5/4}+\frac{5 a^{9/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{672 b^{5/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 112 leaves):

$$\left(15 a^5 x+9 a^4 b x^5-2 a^3 b^2 x^9+156 a^2 b^3 x^{13}+264 a b^4 x^{17}+112 b^5 x^{21}-15 a^5 x \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)\Big/\left(2016 b^3 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1070: Result unnecessarily involves higher level functions.

$$\int x^8 \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 4, 147 leaves, 8 steps):

$$-\frac{5 a^3 x \left(a+b x^4\right)^{1/4}}{336 b^2}+\frac{a^2 x^5 \left(a+b x^4\right)^{1/4}}{168 b}+\frac{1}{28} a x^9 \left(a+b x^4\right)^{1/4}+\frac{1}{14} x^9 \left(a+b x^4\right)^{5/4}-\frac{5 a^{7/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{336 b^{3/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 101 leaves):

$$\left(-5 a^4 x-3 a^3 b x^5+38 a^2 b^2 x^9+60 a b^3 x^{13}+24 b^4 x^{17}+5 a^4 x \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)\Big/\left(336 b^2 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1071: Result unnecessarily involves higher level functions.

$$\int x^4 \left(a+b x^4\right)^{5/4} dx$$

Optimal (type 4, 123 leaves, 7 steps):

$$\frac{a^2 x \left(a+b x^4\right)^{1/4}}{24 b}+\frac{1}{12} a x^5 \left(a+b x^4\right)^{1/4}+\frac{1}{10} x^5 \left(a+b x^4\right)^{5/4}+\frac{a^{5/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \,\text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{24 \sqrt{b} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 90 leaves):

$$\frac{1}{120 b \left(a+b x^4\right)^{3/4}}\left(5 a^3 x+27 a^2 b x^5+34 a b^2 x^9+12 b^3 x^{13}-5 a^3 x \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1072: Result unnecessarily involves higher level functions.

$$\int \left(a+b x^4\right)^{5/4} \, dx$$

Optimal (type 4, 97 leaves, 6 steps):

$$\frac{5}{12} a x \left(a+b x^4\right)^{1/4}+\frac{1}{6} x \left(a+b x^4\right)^{5/4}-\frac{5 a^{3/2} \sqrt{b} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \,\text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{12 \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 76 leaves):

$$\frac{1}{12 \left(a+b x^4\right)^{3/4}}\left(7 a^2 x+9 a b x^5+2 b^2 x^9+5 a^2 x \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1073: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^4} \, dx$$

Optimal (type 4, 99 leaves, 6 steps):

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

Result (type 5, 80 leaves):

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

Problem 1074: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^4\right)^{5/4}}{x^8} \, dx$$

Optimal (type 4, 101 leaves, 6 steps):

$$-\frac{5\,b\,\left(a+b\,x^4\right)^{1/4}}{21\,x^3}-\frac{\left(a+b\,x^4\right)^{5/4}}{7\,x^7}-\frac{5\,b^{5/2}\,\left(1+\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{21\,\sqrt{a}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{21\,x^7\,\left(a+b\,x^4\right)^{3/4}}\left(-3\,a^2-11\,a\,b\,x^4-8\,b^2\,x^8+5\,b^2\,x^8\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^4}{a}\right]\right)$$

Problem 1075: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,x^4\right)^{5/4}}{x^{12}}\,dx$$

Optimal (type 4, 125 leaves, 7 steps):

$$-\frac{5\,b\,\left(a+b\,x^4\right)^{1/4}}{77\,x^7}-\frac{5\,b^2\,\left(a+b\,x^4\right)^{1/4}}{231\,a\,x^3}-\frac{\left(a+b\,x^4\right)^{5/4}}{11\,x^{11}}+\frac{10\,b^{7/2}\,\left(1+\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{231\,a^{3/2}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\left(-21\,a^3-57\,a^2\,b\,x^4-41\,a\,b^2\,x^8-5\,b^3\,x^{12}-10\,b^3\,x^{12}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^4}{a}\right]\right)\Big/\left(231\,a\,x^{11}\,\left(a+b\,x^4\right)^{3/4}\right)$$

Problem 1076: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,x^4\right)^{5/4}}{x^{16}}\,dx$$

Optimal (type 4, 149 leaves, 8 steps):

$$-\frac{b\,\left(a+b\,x^4\right)^{1/4}}{33\,x^{11}}-\frac{b^2\,\left(a+b\,x^4\right)^{1/4}}{231\,a\,x^7}+\frac{2\,b^3\,\left(a+b\,x^4\right)^{1/4}}{231\,a^2\,x^3}-\frac{\left(a+b\,x^4\right)^{5/4}}{15\,x^{15}}-\frac{4\,b^{9/2}\,\left(1+\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{231\,a^{5/2}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 105 leaves):

$$\left(-77\,a^4-189\,a^3\,b\,x^4-117\,a^2\,b^2\,x^8+5\,a\,b^3\,x^{12}+10\,b^4\,x^{16}+20\,b^4\,x^{16}\left(1+\frac{b\,x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^4}{a}\right]\right)\Big/\left(1155\,a^2\,x^{15}\left(a+b\,x^4\right)^{3/4}\right)$$

Problem 1083: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 55 leaves, 5 steps):

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

Result (type 5, 46 leaves):

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

Problem 1084: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^5\left(a+b\,x^4\right)^{1/4}}\,dx$$

Optimal (type 3, 78 leaves, 6 steps):

$$-\frac{\left(a+b\,x^4\right)^{3/4}}{4\,a\,x^4}-\frac{b\,\text{ArcTan}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{8\,a^{5/4}}+\frac{b\,\text{ArcTanh}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{8\,a^{5/4}}$$

Result (type 5, 69 leaves):

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

Problem 1085: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^9\left(a+b\,x^4\right)^{1/4}}\,dx$$

Optimal (type 3, 104 leaves, 7 steps):

$$-\frac{\left(a+b\,x^4\right)^{3/4}}{8\,a\,x^8}+\frac{5\,b\left(a+b\,x^4\right)^{3/4}}{32\,a^2\,x^4}+\frac{5\,b^2\,\text{ArcTan}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{64\,a^{9/4}}-\frac{5\,b^2\,\text{ArcTanh}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{64\,a^{9/4}}$$

Result (type 5, 82 leaves):

$$\left(-4 a^2+a b x^4+5 b^2 x^8-5 b^2 \left(1+\frac{a}{b x^4}\right)^{1/4} x^8 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{a}{b x^4}\right]\right)\Big/ \left(32 a^2 x^8 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1086: Result unnecessarily involves higher level functions.

$$\int \frac{x^{13}}{\left(a+b x^4\right)^{1/4}}\, dx$$

Optimal (type 4, 152 leaves, 7 steps):

$$-\frac{8 a^3 x^2}{39 b^3 \left(a+b x^4\right)^{1/4}}+\frac{4 a^2 x^2 \left(a+b x^4\right)^{3/4}}{39 b^3}-\frac{10 a x^6 \left(a+b x^4\right)^{3/4}}{117 b^2}+\frac{x^{10} \left(a+b x^4\right)^{3/4}}{13 b}+\frac{8 a^{7/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{39 b^{7/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 91 leaves):

$$\left(x^2 \left(12 a^3+2 a^2 b x^4-a b^2 x^8+9 b^3 x^{12}-12 a^3 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\right)\Big/ \left(117 b^3 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1087: Result unnecessarily involves higher level functions.

$$\int \frac{x^9}{\left(a+b x^4\right)^{1/4}}\, dx$$

Optimal (type 4, 128 leaves, 6 steps):

$$\frac{4 a^2 x^2}{15 b^2 \left(a+b x^4\right)^{1/4}}-\frac{2 a x^2 \left(a+b x^4\right)^{3/4}}{15 b^2}+\frac{x^6 \left(a+b x^4\right)^{3/4}}{9 b}-\frac{4 a^{5/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{15 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{45 b^2 \left(a+b x^4\right)^{1/4}} x^2 \left(-6 a^2-a b x^4+5 b^2 x^8+6 a^2 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1088: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(a+b x^4\right)^{1/4}}\, dx$$

Optimal (type 4, 104 leaves, 5 steps):

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

Result (type 5, 64 leaves):

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

Problem 1089: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 74 leaves, 4 steps):

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

Result (type 5, 52 leaves):

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

Problem 1090: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 104 leaves, 5 steps):

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

Result (type 5, 69 leaves):

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

Problem 1091: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^7\,\left(a+b\,x^4\right)^{1/4}}\,dx$$

Optimal (type 4, 128 leaves, 6 steps):

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

Result (type 5, 83 leaves):

$$\left(-4 a^2+2 a b x^4+6 b^2 x^8-3 b^2 x^8 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/ \left(24 a^2 x^6 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1092: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{11} \left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 152 leaves, 7 steps):

$$\frac{7 b^3 x^2}{40 a^3 \left(a+b x^4\right)^{1/4}}-\frac{\left(a+b x^4\right)^{3/4}}{10 a x^{10}}+\frac{7 b \left(a+b x^4\right)^{3/4}}{60 a^2 x^6}-\frac{7 b^2 \left(a+b x^4\right)^{3/4}}{40 a^3 x^2}-\frac{7 b^{5/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{40 a^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\left(-24 a^3+4 a^2 b x^4-14 a b^2 x^8-42 b^3 x^{12}+21 b^3 x^{12} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)\Big/ \left(240 a^3 x^{10} \left(a+b x^4\right)^{1/4}\right)$$

Problem 1101: Result unnecessarily involves higher level functions.

$$\int \frac{x^{10}}{\left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 129 leaves, 7 steps):

$$\frac{7 a^2 x^3}{40 b^2 \left(a+b x^4\right)^{1/4}}-\frac{7 a x^3 \left(a+b x^4\right)^{3/4}}{60 b^2}+\frac{x^7 \left(a+b x^4\right)^{3/4}}{10 b}+\frac{7 a^{5/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{40 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{60 b^2 \left(a+b x^4\right)^{1/4}} x^3 \left(-7 a^2-a b x^4+6 b^2 x^8+7 a^2 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1102: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 105 leaves, 6 steps):

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

Result (type 5, 64 leaves):

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

Problem 1103: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 80 leaves, 5 steps):

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

Result (type 5, 52 leaves):

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

Problem 1104: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 75 leaves, 5 steps):

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

Result (type 5, 70 leaves):

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

Problem 1105: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^6 \left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 105 leaves, 6 steps):

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

Result (type 5, 83 leaves):

$$\left(-3 a^2+3 a b x^4+6 b^2 x^8-4 b^2 x^8 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right) \Big/ \left(15 a^2 x^5 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1106: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{10} \left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 129 leaves, 7 steps):

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

Result (type 5, 93 leaves):

$$\left(-5 a^3+a^2 b x^4-6 a b^2 x^8-12 b^3 x^{12}+8 b^3 x^{12} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right) \Big/ \left(45 a^3 x^9 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1107: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{14} \left(a+b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 153 leaves, 8 steps):

$$\frac{8 b^3}{39 a^3 x \left(a+b x^4\right)^{1/4}}-\frac{\left(a+b x^4\right)^{3/4}}{13 a x^{13}}+\frac{10 b \left(a+b x^4\right)^{3/4}}{117 a^2 x^9}-\frac{4 b^2 \left(a+b x^4\right)^{3/4}}{39 a^3 x^5}-\frac{8 b^{7/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{39 a^{7/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 104 leaves):

$$\left(-9 a^4+a^3 b x^4-2 a^2 b^2 x^8+12 a b^3 x^{12}+24 b^4 x^{16}-16 b^4 x^{16} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right) \Big/ \left(117 a^4 x^{13} \left(a+b x^4\right)^{1/4}\right)$$

Problem 1113: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 55 leaves, 5 steps):

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

Result (type 5, 48 leaves):

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

Problem 1114: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 78 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{4 a x^4}+\frac{3 b \text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{7/4}}+\frac{3 b \text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{7/4}}$$

Result (type 5, 69 leaves):

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

Problem 1115: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^9 \left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 104 leaves, 7 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{8 a x^8}+\frac{7 b \left(a+b x^4\right)^{1/4}}{32 a^2 x^4}-\frac{21 b^2 \text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{11/4}}-\frac{21 b^2 \text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{11/4}}$$

Result (type 5, 83 leaves):

$$\left(-4 a^2+3 a b x^4+7 b^2 x^8-7 b^2 \left(1+\frac{a}{b x^4}\right)^{3/4} x^8 \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{a}{b x^4}\right]\right) \Big/ \left(32 a^2 x^8 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1116: Result unnecessarily involves higher level functions.

$$\int \frac{x^{13}}{\left(a+b x^4\right)^{3/4}}\, dx$$

Optimal (type 4, 128 leaves, 6 steps):

$$\frac{20 a^2 x^2 \left(a+b x^4\right)^{1/4}}{77 b^3}-\frac{10 a x^6 \left(a+b x^4\right)^{1/4}}{77 b^2}+\frac{x^{10} \left(a+b x^4\right)^{1/4}}{11 b}-\frac{40 a^{7/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{77 b^{7/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{77 b^3 \left(a+b x^4\right)^{3/4}} x^2 \left(20 a^3+10 a^2 b x^4-3 a b^2 x^8+7 b^3 x^{12}-20 a^3 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1117: Result unnecessarily involves higher level functions.

$$\int \frac{x^9}{\left(a+b x^4\right)^{3/4}}\, dx$$

Optimal (type 4, 104 leaves, 5 steps):

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

Result (type 5, 79 leaves):

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

Problem 1118: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(a+b x^4\right)^{3/4}}\, dx$$

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

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

Result (type 5, 64 leaves):

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

Problem 1119: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 57 leaves, 3 steps):

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

Result (type 5, 52 leaves):

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

Problem 1120: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 70 leaves):

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

Problem 1121: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^7\left(a+b x^4\right)^{3/4}}\, dx$$

Optimal (type 4, 104 leaves, 5 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{6 a x^6}+\frac{5 b \left(a+b x^4\right)^{1/4}}{12 a^2 x^2}+\frac{5 b^{3/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{12 a^{3/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 83 leaves):

$$\left(-4 a^2+6 a b x^4+10 b^2 x^8+5 b^2 x^8 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right) \Big/ \left(24 a^2 x^6 \left(a+b x^4\right)^{3/4}\right)$$

Problem 1122: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{11} \left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 128 leaves, 6 steps):

$$-\frac{\left(a+b x^4\right)^{1/4}}{10 a x^{10}}+\frac{3 b \left(a+b x^4\right)^{1/4}}{20 a^2 x^6}-\frac{3 b^2 \left(a+b x^4\right)^{1/4}}{8 a^3 x^2}-\frac{3 b^{5/2} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{8 a^{5/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\left(-8 a^3+4 a^2 b x^4-18 a b^2 x^8-30 b^3 x^{12}-15 b^3 x^{12} \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^4}{a}\right]\right) \Big/ \left(80 a^3 x^{10} \left(a+b x^4\right)^{3/4}\right)$$

Problem 1123: Result unnecessarily involves higher level functions.

$$\int \frac{x^{10}}{\left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 106 leaves, 6 steps):

$$-\frac{7 a x^3 \left(a+b x^4\right)^{1/4}}{32 b^2}+\frac{x^7 \left(a+b x^4\right)^{1/4}}{8 b}-\frac{21 a^2 \text{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{11/4}}+\frac{21 a^2 \text{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{64 b^{11/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{32 b^2 \left(a+b x^4\right)^{3/4}} x^3 \left(-7 a^2-3 a b x^4+4 b^2 x^8+7 a^2 \left(1+\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1124: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 80 leaves, 5 steps):

$$\frac{x^3 \left(a+b x^4\right)^{1/4}}{4 b}+\frac{3 a \operatorname{ArcTan}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{8 b^{7/4}}-\frac{3 a \operatorname{ArcTanh}\left[\frac{b^{1/4} x}{\left(a+b x^4\right)^{1/4}}\right]}{8 b^{7/4}}$$

Result (type 5, 64 leaves):

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

Problem 1125: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 57 leaves, 4 steps):

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

Result (type 5, 52 leaves):

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

Problem 1130: Result unnecessarily involves higher level functions.

$$\int \frac{x^{12}}{\left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 129 leaves, 7 steps):

$$\frac{3 a^2 x \left(a+b x^4\right)^{1/4}}{8 b^3}-\frac{3 a x^5 \left(a+b x^4\right)^{1/4}}{20 b^2}+$$
$$\frac{x^9 \left(a+b x^4\right)^{1/4}}{10 b}+\frac{3 a^{5/2} \left(1+\frac{a}{b x^4}\right)^{3/4} x^3 \operatorname{EllipticF}\left[\frac{1}{2} \operatorname{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{8 b^{5/2} \left(a+b x^4\right)^{3/4}}$$

Result (type 5, 90 leaves):

$$\frac{1}{40\, b^3\, (a+b\, x^4)^{3/4}} \left(15\, a^3\, x+9\, a^2\, b\, x^5-2\, a\, b^2\, x^9+4\, b^3\, x^{13}-15\, a^3\, x \left(1+\frac{b\, x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\, x^4}{a}\right]\right)$$

Problem 1131: Result unnecessarily involves higher level functions.

$$\int \frac{x^8}{(a+b\, x^4)^{3/4}}\, dx$$

Optimal (type 4, 105 leaves, 6 steps):

$$-\frac{5\, a\, x\, (a+b\, x^4)^{1/4}}{12\, b^2}+\frac{x^5\, (a+b\, x^4)^{1/4}}{6\, b}-\frac{5\, a^{3/2} \left(1+\frac{a}{b\, x^4}\right)^{3/4} x^3\, \text{EllipticF}\left[\frac{1}{2}\, \text{ArcCot}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{12\, b^{3/2}\, (a+b\, x^4)^{3/4}}$$

Result (type 5, 79 leaves):

$$\frac{1}{12\, b^2\, (a+b\, x^4)^{3/4}} \left(-5\, a^2\, x-3\, a\, b\, x^5+2\, b^2\, x^9+5\, a^2\, x \left(1+\frac{b\, x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\, x^4}{a}\right]\right)$$

Problem 1132: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 5 steps):

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

Result (type 5, 62 leaves):

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

Problem 1133: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 61 leaves, 4 steps):

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

Result (type 5, 47 leaves):

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

Problem 1134: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 85 leaves, 5 steps):

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

Result (type 5, 70 leaves):

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

Problem 1135: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^8 \left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 107 leaves, 6 steps):

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

Result (type 5, 82 leaves):

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

Problem 1136: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{12} \left(a+b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 131 leaves, 7 steps):

$$-\frac{\left(a+b\,x^4\right)^{1/4}}{11\,a\,x^{11}}+\frac{10\,b\,\left(a+b\,x^4\right)^{1/4}}{77\,a^2\,x^7}-\frac{20\,b^2\,\left(a+b\,x^4\right)^{1/4}}{77\,a^3\,x^3}+\frac{40\,b^{7/2}\,\left(1+\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{77\,a^{7/2}\,\left(a+b\,x^4\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\left(-7\,a^3+3\,a^2\,b\,x^4-10\,a\,b^2\,x^8-20\,b^3\,x^{12}-40\,b^3\,x^{12}\,\left(1+\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^4}{a}\right]\right)\Big/\left(77\,a^3\,x^{11}\,\left(a+b\,x^4\right)^{3/4}\right)$$

Problem 1142: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\,\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 3, 70 leaves, 6 steps):

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

Result (type 5, 52 leaves):

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

Problem 1143: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^5\,\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 3, 97 leaves, 7 steps):

$$-\frac{5\,b}{4\,a^2\,\left(a+b\,x^4\right)^{1/4}}-\frac{1}{4\,a\,x^4\,\left(a+b\,x^4\right)^{1/4}}-\frac{5\,b\,\text{ArcTan}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{8\,a^{9/4}}+\frac{5\,b\,\text{ArcTanh}\left[\frac{\left(a+b\,x^4\right)^{1/4}}{a^{1/4}}\right]}{8\,a^{9/4}}$$

Result (type 5, 70 leaves):

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

Problem 1144: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^9 \left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 3, 125 leaves, 8 steps):

$$\frac{45 b^2}{32 a^3 \left(a+b x^4\right)^{1/4}}-\frac{1}{8 a x^8 \left(a+b x^4\right)^{1/4}}+\frac{9 b}{32 a^2 x^4 \left(a+b x^4\right)^{1/4}}+\frac{45 b^2 \text{ArcTan}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{13/4}}-\frac{45 b^2 \text{ArcTanh}\left[\frac{\left(a+b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{13/4}}$$

Result (type 5, 83 leaves):

$$\left(-4 a^2+9 a b x^4+45 b^2 x^8-45 b^2 \left(1+\frac{a}{b x^4}\right)^{1/4} x^8 \,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{a}{b x^4}\right]\right) \Big/ \left(32 a^3 x^8 \left(a+b x^4\right)^{1/4}\right)$$

Problem 1145: Result unnecessarily involves higher level functions.

$$\int \frac{x^{13}}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 128 leaves, 6 steps):

$$\frac{4 a^2 x^2}{3 b^3 \left(a+b x^4\right)^{1/4}}-\frac{2 a x^6}{9 b^2 \left(a+b x^4\right)^{1/4}}+\frac{x^{10}}{9 b \left(a+b x^4\right)^{1/4}}-\frac{8 a^{5/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{3 b^{7/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 79 leaves):

$$\frac{1}{9 b^3 \left(a+b x^4\right)^{1/4}} x^2 \left(-12 a^2-2 a b x^4+b^2 x^8+12 a^2 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^4}{a}\right]\right)$$

Problem 1146: Result unnecessarily involves higher level functions.

$$\int \frac{x^9}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 104 leaves, 5 steps):

$$-\frac{6 a x^2}{5 b^2 \left(a+b x^4\right)^{1/4}}+\frac{x^6}{5 b \left(a+b x^4\right)^{1/4}}+\frac{12 a^{3/2} \left(1+\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{5 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 66 leaves):

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

Problem 1147: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 77 leaves, 4 steps):

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

Result (type 5, 54 leaves):

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

Problem 1148: Result unnecessarily involves higher level functions.

$$\int \frac{x}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 57 leaves, 3 steps):

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

Result (type 5, 57 leaves):

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

Problem 1149: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 \left(a+b x^4\right)^{5/4}} \, dx$$

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

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

Result (type 5, 71 leaves):

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

Problem 1150: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^7\,\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 4, 104 leaves, 5 steps):

$$-\frac{1}{6\,a\,x^6\,\left(a+b\,x^4\right)^{1/4}}+\frac{7\,b}{12\,a^2\,x^2\,\left(a+b\,x^4\right)^{1/4}}+\frac{7\,b^{3/2}\,\left(1+\frac{b\,x^4}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{4\,a^{5/2}\,\left(a+b\,x^4\right)^{1/4}}$$

Result (type 5, 83 leaves):

$$\left(-4\,a^2+14\,a\,b\,x^4+42\,b^2\,x^8-21\,b^2\,x^8\,\left(1+\frac{b\,x^4}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^4}{a}\right]\right)\Big/\left(24\,a^3\,x^6\,\left(a+b\,x^4\right)^{1/4}\right)$$

Problem 1151: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^{11}\,\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 4, 128 leaves, 6 steps):

$$-\frac{1}{10\,a\,x^{10}\,\left(a+b\,x^4\right)^{1/4}}+\frac{11\,b}{60\,a^2\,x^6\,\left(a+b\,x^4\right)^{1/4}}-\frac{77\,b^2}{120\,a^3\,x^2\,\left(a+b\,x^4\right)^{1/4}}-\frac{77\,b^{5/2}\,\left(1+\frac{b\,x^4}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],\,2\right]}{40\,a^{7/2}\,\left(a+b\,x^4\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\left(-24\,a^3+44\,a^2\,b\,x^4-154\,a\,b^2\,x^8-462\,b^3\,x^{12}+231\,b^3\,x^{12}\,\left(1+\frac{b\,x^4}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^4}{a}\right]\right)\Big/\left(240\,a^4\,x^{10}\,\left(a+b\,x^4\right)^{1/4}\right)$$

Problem 1160: Result unnecessarily involves higher level functions.

$$\int \frac{x^{14}}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 129 leaves, 7 steps):

$$\frac{77 a^2 x^3}{120 b^3 \left(a+b x^4\right)^{1/4}}-\frac{11 a x^7}{60 b^2 \left(a+b x^4\right)^{1/4}}+\frac{x^{11}}{10 b \left(a+b x^4\right)^{1/4}}+\frac{77 a^{5/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{40 b^{7/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{60 b^3 \left(a+b x^4\right)^{1/4}} x^3 \left(-77 a^2-11 a b x^4+6 b^2 x^8+77 a^2 \left(1+\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^4}{a}\right]\right)$$

Problem 1161: Result unnecessarily involves higher level functions.

$$\int \frac{x^{10}}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 105 leaves, 6 steps):

$$-\frac{7 a x^3}{12 b^2 \left(a+b x^4\right)^{1/4}}+\frac{x^7}{6 b \left(a+b x^4\right)^{1/4}}-\frac{7 a^{3/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{4 b^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 66 leaves):

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

Problem 1162: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 83 leaves, 5 steps):

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

Result (type 5, 54 leaves):

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

Problem 1163: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 59 leaves, 4 steps):

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

Result (type 5, 58 leaves):

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

Problem 1164: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^2 \left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 79 leaves, 5 steps):

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

Result (type 5, 71 leaves):

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

Problem 1165: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^6 \left(a+b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 105 leaves, 6 steps):

$$-\frac{1}{5 a x^5 \left(a+b x^4\right)^{1/4}}+\frac{6 b}{5 a^2 x \left(a+b x^4\right)^{1/4}}-\frac{12 b^{3/2} \left(1+\frac{a}{b x^4}\right)^{1/4} x \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{5 a^{5/2} \left(a+b x^4\right)^{1/4}}$$

Result (type 5, 83 leaves):

$$\left(-a^2+6\,a\,b\,x^4+12\,b^2\,x^8-8\,b^2\,x^8\left(1+\frac{b\,x^4}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^4}{a}\right]\right)\Big/\left(5\,a^3\,x^5\left(a+b\,x^4\right)^{1/4}\right)$$

Problem 1166: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^{10}\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 4, 129 leaves, 7 steps):

$$-\frac{1}{9\,a\,x^9\left(a+b\,x^4\right)^{1/4}}+\frac{2\,b}{9\,a^2\,x^5\left(a+b\,x^4\right)^{1/4}}-\frac{4\,b^2}{3\,a^3\,x\left(a+b\,x^4\right)^{1/4}}+\frac{8\,b^{5/2}\left(1+\frac{a}{b\,x^4}\right)^{1/4}x\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{3\,a^{7/2}\left(a+b\,x^4\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\left(-a^3+2\,a^2\,b\,x^4-12\,a\,b^2\,x^8-24\,b^3\,x^{12}+16\,b^3\,x^{12}\left(1+\frac{b\,x^4}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^4}{a}\right]\right)\Big/\left(9\,a^4\,x^9\left(a+b\,x^4\right)^{1/4}\right)$$

Problem 1167: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^{14}\left(a+b\,x^4\right)^{5/4}}\,dx$$

Optimal (type 4, 153 leaves, 8 steps):

$$-\frac{1}{13\,a\,x^{13}\left(a+b\,x^4\right)^{1/4}}+\frac{14\,b}{117\,a^2\,x^9\left(a+b\,x^4\right)^{1/4}}-\frac{28\,b^2}{117\,a^3\,x^5\left(a+b\,x^4\right)^{1/4}}+\frac{56\,b^3}{39\,a^4\,x\left(a+b\,x^4\right)^{1/4}}-\frac{112\,b^{7/2}\left(1+\frac{a}{b\,x^4}\right)^{1/4}x\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{39\,a^{9/2}\left(a+b\,x^4\right)^{1/4}}$$

Result (type 5, 105 leaves):

$$\left(-9\,a^4+14\,a^3\,b\,x^4-28\,a^2\,b^2\,x^8+168\,a\,b^3\,x^{12}+336\,b^4\,x^{16}-224\,b^4\,x^{16}\left(1+\frac{b\,x^4}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^4}{a}\right]\right)\Big/\left(117\,a^5\,x^{13}\left(a+b\,x^4\right)^{1/4}\right)$$

Problem 1168: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+b\,x^4\right)^{7/4}}\,dx$$

Optimal (type 4, 83 leaves, 5 steps):

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

Result (type 5, 56 leaves):

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

Problem 1170: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+b\,x^4\right)^{11/4}}\,dx$$

Optimal (type 4, 102 leaves, 6 steps):

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

Result (type 5, 72 leaves):

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

Problem 1178: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a-b\,x^4\right)^{1/4}}{x}\,dx$$

Optimal (type 3, 69 leaves, 6 steps):

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

Result (type 5, 63 leaves):

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

Problem 1179: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a-b\,x^4\right)^{1/4}}{x^5}\,dx$$

Optimal (type 3, 78 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{4 x^4}+\frac{b \operatorname{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{3/4}}+\frac{b \operatorname{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{3/4}}$$

Result (type 5, 67 leaves):

$$\frac{-3 a+3 b x^4+b \left(1-\frac{a}{b x^4}\right)^{3/4} x^4 \operatorname{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{a}{b x^4}\right]}{12 x^4 \left(a-b x^4\right)^{3/4}}$$

Problem 1180: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a-b x^4\right)^{1/4}}{x^9} \, dx$$

Optimal (type 3, 105 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{8 x^8}+\frac{b \left(a-b x^4\right)^{1/4}}{32 a x^4}+\frac{3 b^2 \operatorname{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{7/4}}+\frac{3 b^2 \operatorname{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{7/4}}$$

Result (type 5, 83 leaves):

$$\left(-4 a^2+5 a b x^4-b^2 x^8+b^2 \left(1-\frac{a}{b x^4}\right)^{3/4} x^8 \operatorname{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{a}{b x^4}\right]\right) \Big/ \left(32 a x^8 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1181: Result unnecessarily involves higher level functions.

$$\int x^9 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 130 leaves, 6 steps):

$$-\frac{2 a^2 x^2 \left(a-b x^4\right)^{1/4}}{77 b^2}-\frac{a x^6 \left(a-b x^4\right)^{1/4}}{77 b}+\frac{1}{11} x^{10} \left(a-b x^4\right)^{1/4}+\frac{4 a^{7/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \operatorname{EllipticF}\left[\frac{1}{2} \operatorname{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{77 b^{5/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{77 b^2 \left(a-b x^4\right)^{3/4}} x^2 \left(-2 a^3+a^2 b x^4+8 a b^2 x^8-7 b^3 x^{12}+2 a^3 \left(1-\frac{b x^4}{a}\right)^{3/4} \operatorname{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right)$$

Problem 1182: Result unnecessarily involves higher level functions.

$$\int x^5 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 105 leaves, 5 steps):

$$-\frac{a x^2 \left(a-b x^4\right)^{1/4}}{21 b}+\frac{1}{7} x^6 \left(a-b x^4\right)^{1/4}+\frac{2 a^{5/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{21 b^{3/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{21 b \left(a-b x^4\right)^{3/4}} x^2 \left(-a^2+4 a b x^4-3 b^2 x^8+a^2 \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right)$$

Problem 1183: Result unnecessarily involves higher level functions.

$$\int x \left(a-b x^4\right)^{1/4} \, dx$$

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

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

Result (type 5, 64 leaves):

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

Problem 1184: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 68 leaves):

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

Problem 1185: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a-b x^4\right)^{1/4}}{x^7} \, dx$$

Optimal (type 4, 105 leaves, 5 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{6 x^6}+\frac{b \left(a-b x^4\right)^{1/4}}{12 a x^2}-\frac{b^{3/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{12 \sqrt{a} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 84 leaves):

$$\left(-4 a^2+6 a b x^4-2 b^2 x^8-b^2 x^8 \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right)\Big/\left(24 a x^6 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1186: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a-b x^4\right)^{1/4}}{x^{11}} \, dx$$

Optimal (type 4, 130 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{10 x^{10}}+\frac{b \left(a-b x^4\right)^{1/4}}{60 a x^6}+\frac{b^2 \left(a-b x^4\right)^{1/4}}{24 a^2 x^2}-\frac{b^{5/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{24 a^{3/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 95 leaves):

$$\left(-24 a^3+28 a^2 b x^4+6 a b^2 x^8-10 b^3 x^{12}-5 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right)\Big/\left(240 a^2 x^{10} \left(a-b x^4\right)^{3/4}\right)$$

Problem 1187: Result unnecessarily involves higher level functions.

$$\int x^6 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 3, 263 leaves, 12 steps):

$$-\frac{a x^3 \left(a-b x^4\right)^{1/4}}{32 b}+\frac{1}{8} x^7 \left(a-b x^4\right)^{1/4}-\frac{3 a^2 \text{ArcTan}\left[1-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{64 \sqrt{2} b^{7/4}}+\frac{3 a^2 \text{ArcTan}\left[1+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{64 \sqrt{2} b^{7/4}}+\frac{3 a^2 \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{128 \sqrt{2} b^{7/4}}-\frac{3 a^2 \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{128 \sqrt{2} b^{7/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{32 b \left(a-b x^4\right)^{3/4}} x^3 \left(-a^2+5 a b x^4-4 b^2 x^8+a^2 \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)$$

Problem 1188: Result unnecessarily involves higher level functions.

$$\int x^2 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 3, 232 leaves, 11 steps):

$$\frac{1}{4} x^3 \left(a-b x^4\right)^{1/4}-\frac{a \,\text{ArcTan}\left[1-\frac{\sqrt{2}\, b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{8 \sqrt{2}\, b^{3/4}}+\frac{a \,\text{ArcTan}\left[1+\frac{\sqrt{2}\, b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{8 \sqrt{2}\, b^{3/4}}+\frac{a \,\text{Log}\left[1+\frac{\sqrt{b}\, x^2}{\sqrt{a-b x^4}}-\frac{\sqrt{2}\, b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{16 \sqrt{2}\, b^{3/4}}-\frac{a \,\text{Log}\left[1+\frac{\sqrt{b}\, x^2}{\sqrt{a-b x^4}}+\frac{\sqrt{2}\, b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{16 \sqrt{2}\, b^{3/4}}$$

Result (type 5, 64 leaves):

$$\frac{x^3 \left(3 a-3 b x^4+a \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)}{12 \left(a-b x^4\right)^{3/4}}$$

Problem 1189: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a-b x^4\right)^{1/4}}{x^2} \, dx$$

Optimal (type 3, 226 leaves, 11 steps):

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

Result (type 5, 68 leaves):

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

Problem 1194: Result unnecessarily involves higher level functions.

$$\int x^{12} \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 156 leaves, 8 steps):

$$-\frac{3 a^3 x \left(a-b x^4\right)^{1/4}}{112 b^3}-\frac{3 a^2 x^5 \left(a-b x^4\right)^{1/4}}{280 b^2}-\frac{a x^9 \left(a-b x^4\right)^{1/4}}{140 b}+\frac{1}{14} x^{13} \left(a-b x^4\right)^{1/4}-\frac{3 a^{7/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \,\text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{112 b^{5/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 102 leaves):

$$\left(-15 a^4 x+9 a^3 b x^5+2 a^2 b^2 x^9+44 a b^3 x^{13}-40 b^4 x^{17}+15 a^4 x \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right)\Big/\left(560 b^3 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1195: Result unnecessarily involves higher level functions.

$$\int x^8 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 131 leaves, 7 steps):

$$-\frac{a^2 x \left(a-b x^4\right)^{1/4}}{24 b^2}-\frac{a x^5 \left(a-b x^4\right)^{1/4}}{60 b}+\frac{1}{10} x^9 \left(a-b x^4\right)^{1/4}-\frac{a^{5/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{24 b^{3/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\left(-5 a^3 x+3 a^2 b x^5+14 a b^2 x^9-12 b^3 x^{13}+5 a^3 x \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right)\Big/\left(120 b^2 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1196: Result unnecessarily involves higher level functions.

$$\int x^4 \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 106 leaves, 6 steps):

$$-\frac{a x \left(a-b x^4\right)^{1/4}}{12 b}+\frac{1}{6} x^5 \left(a-b x^4\right)^{1/4}-\frac{a^{3/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{12 \sqrt{b} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 79 leaves):

$$\frac{1}{12 b \left(a-b x^4\right)^{3/4}}\left(-a^2 x+3 a b x^5-2 b^2 x^9+a^2 x \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right)$$

Problem 1197: Result unnecessarily involves higher level functions.

$$\int \left(a-b x^4\right)^{1/4} \, dx$$

Optimal (type 4, 83 leaves, 5 steps):

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

Result (type 5, 62 leaves):

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

Problem 1198: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a-b\,x^4\right)^{1/4}}{x^4}\,dx$$

Optimal (type 4, 85 leaves, 5 steps):

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

Result (type 5, 67 leaves):

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

Problem 1199: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a-b\,x^4\right)^{1/4}}{x^8}\,dx$$

Optimal (type 4, 108 leaves, 6 steps):

$$-\frac{\left(a-b\,x^4\right)^{1/4}}{7\,x^7}+\frac{b\left(a-b\,x^4\right)^{1/4}}{21\,a\,x^3}+\frac{2\,b^{5/2}\left(1-\frac{a}{b\,x^4}\right)^{3/4}x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{21\,a^{3/2}\left(a-b\,x^4\right)^{3/4}}$$

Result (type 5, 84 leaves):

$$\left(-3\,a^2+4\,a\,b\,x^4-b^2\,x^8-2\,b^2\,x^8\left(1-\frac{b\,x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,x^4}{a}\right]\right)\Big/\left(21\,a\,x^7\left(a-b\,x^4\right)^{3/4}\right)$$

Problem 1200: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a-b\,x^4\right)^{1/4}}{x^{12}}\,dx$$

Optimal (type 4, 133 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{11 x^{11}}+\frac{b \left(a-b x^4\right)^{1/4}}{77 a x^7}+\frac{2 b^2 \left(a-b x^4\right)^{1/4}}{77 a^2 x^3}+\frac{4 b^{7/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{77 a^{5/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\left(-7 a^3+8 a^2 b x^4+a b^2 x^8-2 b^3 x^{12}-4 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right)\Big/ \left(77 a^2 x^{11} \left(a-b x^4\right)^{3/4}\right)$$

Problem 1201: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a-b x^4\right)^{1/4}}{x^{16}} \, dx$$

Optimal (type 4, 158 leaves, 8 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{15 x^{15}}+\frac{b \left(a-b x^4\right)^{1/4}}{165 a x^{11}}+\frac{2 b^2 \left(a-b x^4\right)^{1/4}}{231 a^2 x^7}+\frac{4 b^3 \left(a-b x^4\right)^{1/4}}{231 a^3 x^3}+\frac{8 b^{9/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{231 a^{7/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 106 leaves):

$$\left(-77 a^4+84 a^3 b x^4+3 a^2 b^2 x^8+10 a b^3 x^{12}-20 b^4 x^{16}-40 b^4 x^{16} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right)\Big/ \left(1155 a^3 x^{15} \left(a-b x^4\right)^{3/4}\right)$$

Problem 1207: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 3, 57 leaves, 5 steps):

$$\frac{\text{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{2 a^{1/4}}-\frac{\text{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{2 a^{1/4}}$$

Result (type 5, 47 leaves):

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

Problem 1208: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 3, 81 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{3/4}}{4 a x^4}+\frac{b \, \text{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{5/4}}-\frac{b \, \text{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{5/4}}$$

Result (type 5, 70 leaves):

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

Problem 1209: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^9 \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 3, 108 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{3/4}}{8 a x^8}-\frac{5 b \left(a-b x^4\right)^{3/4}}{32 a^2 x^4}+\frac{5 b^2 \, \text{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{9/4}}-\frac{5 b^2 \, \text{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{9/4}}$$

Result (type 5, 84 leaves):

$$\left(-4 a^2-a b x^4+5 b^2 x^8-5 b^2 \left(1-\frac{a}{b x^4}\right)^{1/4} x^8 \, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{a}{b x^4}\right]\right) \Big/ \left(32 a^2 x^8 \left(a-b x^4\right)^{1/4}\right)$$

Problem 1210: Result unnecessarily involves higher level functions.

$$\int \frac{x^{13}}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 133 leaves, 6 steps):

$$-\frac{4 a^2 x^2 \left(a-b x^4\right)^{3/4}}{39 b^3}-\frac{10 a x^6 \left(a-b x^4\right)^{3/4}}{117 b^2}-\frac{x^{10} \left(a-b x^4\right)^{3/4}}{13 b}+\frac{8 a^{7/2} \left(1-\frac{b x^4}{a}\right)^{1/4} \, \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} \, x^2}{\sqrt{a}}\right],2\right]}{39 b^{7/2} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 91 leaves):

$$\left(x^2 \left(-12 a^3+2 a^2 b x^4+a b^2 x^8+9 b^3 x^{12}+12 a^3 \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^4}{a}\right]\right)\right)\Big/ \left(117 b^3 \left(a-b x^4\right)^{1/4}\right)$$

Problem 1211: Result unnecessarily involves higher level functions.

$$\int \frac{x^9}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 108 leaves, 5 steps):

$$-\frac{2 a x^2 \left(a-b x^4\right)^{3/4}}{15 b^2}-\frac{x^6 \left(a-b x^4\right)^{3/4}}{9 b}+\frac{4 a^{5/2} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{15 b^{5/2} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{45 b^2 \left(a-b x^4\right)^{1/4}} x^2 \left(-6 a^2+a b x^4+5 b^2 x^8+6 a^2 \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^4}{a}\right]\right)$$

Problem 1212: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 85 leaves, 4 steps):

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

Result (type 5, 66 leaves):

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

Problem 1213: Result unnecessarily involves higher level functions.

$$\int \frac{x}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 59 leaves, 3 steps):

$$\frac{\sqrt{a} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{\sqrt{b} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 53 leaves):

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

Problem 1214: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 85 leaves, 4 steps):

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

Result (type 5, 71 leaves):

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

Problem 1215: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^7 \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 108 leaves, 5 steps):

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

Result (type 5, 84 leaves):

$$\left(-4 a^2-2 a b x^4+6 b^2 x^8-3 b^2 x^8 \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, \frac{b x^4}{a}\right]\right) \Big/ \left(24 a^2 x^6 \left(a-b x^4\right)^{1/4}\right)$$

Problem 1216: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{11} \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 133 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{3/4}}{10 a x^{10}}-\frac{7 b \left(a-b x^4\right)^{3/4}}{60 a^2 x^6}-\frac{7 b^2 \left(a-b x^4\right)^{3/4}}{40 a^3 x^2}-\frac{7 b^{5/2} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right], 2\right]}{40 a^{5/2} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 95 leaves):

$$\left(-24 a^3-4 a^2 b x^4-14 a b^2 x^8+42 b^3 x^{12}-21 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^4}{a}\right]\right)\Big/\left(240 a^3 x^{10} \left(a-b x^4\right)^{1/4}\right)$$

Problem 1225: Result unnecessarily involves higher level functions.

$$\int \frac{x^{10}}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 134 leaves, 7 steps):

$$-\frac{7 a^2 \left(a-b x^4\right)^{3/4}}{40 b^3 x}-\frac{7 a x^3 \left(a-b x^4\right)^{3/4}}{60 b^2}-\frac{x^7 \left(a-b x^4\right)^{3/4}}{10 b}+\frac{7 a^{5/2} \left(1-\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{40 b^{5/2} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{60 b^2 \left(a-b x^4\right)^{1/4}} x^3 \left(-7 a^2+a b x^4+6 b^2 x^8+7 a^2 \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)$$

Problem 1226: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 109 leaves, 6 steps):

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

Result (type 5, 66 leaves):

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

Problem 1227: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 86 leaves, 5 steps):

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

Result (type 5, 53 leaves):

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

Problem 1228: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^2 \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 61 leaves, 4 steps):

$$-\frac{\sqrt{b} \left(1-\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{\sqrt{a} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 71 leaves):

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

Problem 1229: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^6 \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 86 leaves, 5 steps):

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

Result (type 5, 84 leaves):

$$\left(-3 \left(a^2+a b x^4-2 b^2 x^8\right)-4 b^2 x^8 \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right) \Big/ \left(15 a^2 x^5 \left(a-b x^4\right)^{1/4}\right)$$

Problem 1230: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{10} \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 109 leaves, 6 steps):

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

Result (type 5, 95 leaves):

$$\left(-5 a^3-a^2 b x^4-6 a b^2 x^8+12 b^3 x^{12}-8 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)\Big/ \left(45 a^3 x^9 \left(a-b x^4\right)^{1/4}\right)$$

Problem 1231: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{14} \left(a-b x^4\right)^{1/4}} \, dx$$

Optimal (type 4, 134 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{3/4}}{13 a x^{13}}-\frac{10 b \left(a-b x^4\right)^{3/4}}{117 a^2 x^9}-\frac{4 b^2 \left(a-b x^4\right)^{3/4}}{39 a^3 x^5}-\frac{8 b^{7/2} \left(1-\frac{a}{b x^4}\right)^{1/4} x \,\text{EllipticE}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b}\, x^2}{\sqrt{a}}\right],2\right]}{39 a^{7/2} \left(a-b x^4\right)^{1/4}}$$

Result (type 5, 106 leaves):

$$\left(-9 a^4-a^3 b x^4-2 a^2 b^2 x^8-12 a b^3 x^{12}+24 b^4 x^{16}-16 b^4 x^{16} \left(1-\frac{b x^4}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)\Big/ \left(117 a^4 x^{13} \left(a-b x^4\right)^{1/4}\right)$$

Problem 1237: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 57 leaves, 5 steps):

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

Result (type 5, 49 leaves):

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

Problem 1238: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 81 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{4 a x^4}-\frac{3 b \operatorname{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{7/4}}-\frac{3 b \operatorname{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{8 a^{7/4}}$$

Result (type 5, 70 leaves):

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

Problem 1239: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^9 \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 108 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{8 a x^8}-\frac{7 b \left(a-b x^4\right)^{1/4}}{32 a^2 x^4}-\frac{21 b^2 \operatorname{ArcTan}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{11/4}}-\frac{21 b^2 \operatorname{ArcTanh}\left[\frac{\left(a-b x^4\right)^{1/4}}{a^{1/4}}\right]}{64 a^{11/4}}$$

Result (type 5, 84 leaves):

$$\left(-4 a^2-3 a b x^4+7 b^2 x^8-7 b^2 \left(1-\frac{a}{b x^4}\right)^{3/4} x^8 \operatorname{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{a}{b x^4}\right]\right) \Big/ \left(32 a^2 x^8 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1240: Result unnecessarily involves higher level functions.

$$\int \frac{x^{13}}{\left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 133 leaves, 6 steps):

$$-\frac{20 a^2 x^2 \left(a-b x^4\right)^{1/4}}{77 b^3}-\frac{10 a x^6 \left(a-b x^4\right)^{1/4}}{77 b^2}-\frac{x^{10} \left(a-b x^4\right)^{1/4}}{11 b}+\frac{40 a^{7/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \operatorname{EllipticF}\left[\frac{1}{2} \operatorname{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{77 b^{7/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 92 leaves):

$$\frac{1}{77\,b^3\,\left(a-b\,x^4\right)^{3/4}}\,x^2\,\left(-20\,a^3+10\,a^2\,b\,x^4+3\,a\,b^2\,x^8+7\,b^3\,x^{12}+20\,a^3\,\left(1-\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,\frac{b\,x^4}{a}\right]\right)$$

Problem 1241: Result unnecessarily involves higher level functions.

$$\int\frac{x^9}{\left(a-b\,x^4\right)^{3/4}}\,dx$$

Optimal (type 4, 108 leaves, 5 steps):

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

Result (type 5, 79 leaves):

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

Problem 1242: Result unnecessarily involves higher level functions.

$$\int\frac{x^5}{\left(a-b\,x^4\right)^{3/4}}\,dx$$

Optimal (type 4, 85 leaves, 4 steps):

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

Result (type 5, 66 leaves):

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

Problem 1243: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 59 leaves, 3 steps):

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

Result (type 5, 53 leaves):

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

Problem 1244: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 85 leaves, 4 steps):

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

Result (type 5, 70 leaves):

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

Problem 1245: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^7 \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 108 leaves, 5 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{6 a x^6}-\frac{5 b \left(a-b x^4\right)^{1/4}}{12 a^2 x^2}+\frac{5 b^{3/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{12 a^{3/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 84 leaves):

$$\left(-4 a^2-6 a b x^4+10 b^2 x^8+5 b^2 x^8 \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right) \Big/ \left(24 a^2 x^6 \left(a-b x^4\right)^{3/4}\right)$$

Problem 1246: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{11} \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 133 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{10 a x^{10}}-\frac{3 b \left(a-b x^4\right)^{1/4}}{20 a^2 x^6}-\frac{3 b^2 \left(a-b x^4\right)^{1/4}}{8 a^3 x^2}+\frac{3 b^{5/2} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{8 a^{5/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 95 leaves):

$$\left(-8 a^3-4 a^2 b x^4-18 a b^2 x^8+30 b^3 x^{12}+15 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^4}{a}\right]\right) \Big/ \left(80 a^3 x^{10} \left(a-b x^4\right)^{3/4}\right)$$

Problem 1247: Result unnecessarily involves higher level functions.

$$\int \frac{x^{10}}{\left(a-b x^4\right)^{3/4}} \, dx$$

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

$$-\frac{7 a x^3 \left(a-b x^4\right)^{1/4}}{32 b^2}-\frac{x^7 \left(a-b x^4\right)^{1/4}}{8 b}-\frac{21 a^2 \text{ArcTan}\left[1-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{64 \sqrt{2} b^{11/4}}+\frac{21 a^2 \text{ArcTan}\left[1+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{64 \sqrt{2} b^{11/4}}+\frac{21 a^2 \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{128 \sqrt{2} b^{11/4}}-\frac{21 a^2 \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{128 \sqrt{2} b^{11/4}}$$

Result (type 5, 81 leaves):

$$\frac{1}{32 b^2 \left(a-b x^4\right)^{3/4}} x^3 \left(-7 a^2+3 a b x^4+4 b^2 x^8+7 a^2 \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b x^4}{a}\right]\right)$$

Problem 1248: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 3, 235 leaves, 11 steps):

$$-\frac{x^3 \left(a-b x^4\right)^{1/4}}{4 b}-\frac{3 a \text{ArcTan}\left[1-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{8 \sqrt{2} b^{7/4}}+\frac{3 a \text{ArcTan}\left[1+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{8 \sqrt{2} b^{7/4}}+\frac{3 a \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}-\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{16 \sqrt{2} b^{7/4}}-\frac{3 a \text{Log}\left[1+\frac{\sqrt{b} x^2}{\sqrt{a-b x^4}}+\frac{\sqrt{2} b^{1/4} x}{\left(a-b x^4\right)^{1/4}}\right]}{16 \sqrt{2} b^{7/4}}$$

Result (type 5, 66 leaves):

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

Problem 1249: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 209 leaves, 10 steps):

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

Result (type 5, 53 leaves):

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

Problem 1254: Result unnecessarily involves higher level functions.

$$\int \frac{x^{12}}{\left(a-b\,x^4\right)^{3/4}}\,dx$$

Optimal (type 4, 134 leaves, 7 steps):

$$-\frac{3\,a^2\,x\left(a-b\,x^4\right)^{1/4}}{8\,b^3}-\frac{3\,a\,x^5\left(a-b\,x^4\right)^{1/4}}{20\,b^2}-\frac{x^9\left(a-b\,x^4\right)^{1/4}}{10\,b}-\frac{3\,a^{5/2}\left(1-\frac{a}{b\,x^4}\right)^{3/4}x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{8\,b^{5/2}\left(a-b\,x^4\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{1}{40\,b^3\left(a-b\,x^4\right)^{3/4}}\left(-15\,a^3\,x+9\,a^2\,b\,x^5+2\,a\,b^2\,x^9+4\,b^3\,x^{13}+15\,a^3\,x\left(1-\frac{b\,x^4}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,x^4}{a}\right]\right)$$

Problem 1255: Result unnecessarily involves higher level functions.

$$\int \frac{x^8}{\left(a-b\,x^4\right)^{3/4}}\,dx$$

Optimal (type 4, 109 leaves, 6 steps):

$$-\frac{5\,a\,x\,\left(a-b\,x^4\right)^{1/4}}{12\,b^2}-\frac{x^5\,\left(a-b\,x^4\right)^{1/4}}{6\,b}-\frac{5\,a^{3/2}\,\left(1-\frac{a}{b\,x^4}\right)^{3/4}\,x^3\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{12\,b^{3/2}\,\left(a-b\,x^4\right)^{3/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{12\,b^2\,\left(a-b\,x^4\right)^{3/4}}$$
$$\left(-5\,a^2\,x+3\,a\,b\,x^5+2\,b^2\,x^9+5\,a^2\,x\,\left(1-\frac{b\,x^4}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,x^4}{a}\right]\right)$$

Problem 1256: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 86 leaves, 5 steps):

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

Result (type 5, 64 leaves):

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

Problem 1257: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 63 leaves, 4 steps):

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

Result (type 5, 48 leaves):

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

Problem 1258: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 88 leaves, 5 steps):

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

Result (type 5, 70 leaves):

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

Problem 1259: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^8 \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 111 leaves, 6 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{7 a x^7}-\frac{2 b \left(a-b x^4\right)^{1/4}}{7 a^2 x^3}-\frac{4 b^{5/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{7 a^{5/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 84 leaves):

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

Problem 1260: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^{12} \left(a-b x^4\right)^{3/4}} \, dx$$

Optimal (type 4, 136 leaves, 7 steps):

$$-\frac{\left(a-b x^4\right)^{1/4}}{11 a x^{11}}-\frac{10 b \left(a-b x^4\right)^{1/4}}{77 a^2 x^7}-\frac{20 b^2 \left(a-b x^4\right)^{1/4}}{77 a^3 x^3}-\frac{40 b^{7/2} \left(1-\frac{a}{b x^4}\right)^{3/4} x^3 \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x^2}{\sqrt{a}}\right],2\right]}{77 a^{7/2} \left(a-b x^4\right)^{3/4}}$$

Result (type 5, 95 leaves):

$$\left(-7 a^3-3 a^2 b x^4-10 a b^2 x^8+20 b^3 x^{12}+40 b^3 x^{12} \left(1-\frac{b x^4}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^4}{a}\right]\right) \Big/ \left(77 a^3 x^{11} \left(a-b x^4\right)^{3/4}\right)$$

Problem 1261: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(a-b x^4\right)^{5/4}} \, dx$$

Optimal (type 4, 81 leaves, 5 steps):

$$\frac{1}{b\,x\,\left(a-b\,x^4\right)^{1/4}}-\frac{\left(1-\frac{a}{b\,x^4}\right)^{1/4}x\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x^2}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,\sqrt{b}\,\left(a-b\,x^4\right)^{1/4}}$$

Result (type 5, 59 leaves):

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

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

$$\int\frac{1}{x^4\left(a+b\,x^6\right)}\,dx$$

Optimal (type 3, 40 leaves, 3 steps):

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

Result (type 3, 101 leaves):

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

Problem 1348: Result more than twice size of optimal antiderivative.

$$\int\frac{x^2}{1-x^6}\,dx$$

Optimal (type 3, 8 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[x^3\right]}{3}$$

Result (type 3, 23 leaves):

$$-\frac{1}{6}\,\text{Log}\left[1-x^3\right]+\frac{1}{6}\,\text{Log}\left[1+x^3\right]$$

Problem 1394: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^7}{\sqrt{2+x^6}}\,dx$$

Optimal (type 4, 186 leaves, 3 steps):

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

Result (type 4, 133 leaves):

$$\frac{1}{15 \sqrt{2+x^6}} \left(3 x^2 \left(2+x^6\right) - 4 (-1)^{1/6} 2^{1/3} \times 3^{3/4} \sqrt{(-1)^{5/6} \left(-1+\left(-\frac{1}{2}\right)^{1/3} x^2\right)} \sqrt{1+\left(-\frac{1}{2}\right)^{1/3} x^2+\left(-\frac{1}{2}\right)^{2/3} x^4} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-i+\sqrt{3}\right) \left(2+2^{2/3} x^2\right)}}{2 \times 3^{1/4}}\right], (-1)^{1/3}\right]\right)$$

Problem 1395: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x}{\sqrt{2+x^6}} \, dx$$

Optimal (type 4, 166 leaves, 2 steps):

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

Result (type 4, 116 leaves):

$$\frac{1}{3^{1/4}\sqrt{2+x^6}}(-1)^{1/6}\,2^{1/3}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]$$

Problem 1396: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\sqrt{2+x^6}}\,dx$$

Optimal (type 4, 186 leaves, 3 steps):

$$-\frac{\sqrt{2+x^6}}{8x^4}-\left(\sqrt{2+\sqrt{3}}\,\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(8\times 2^{1/6}\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)$$

Result (type 4, 136 leaves):

$$-\frac{\sqrt{2+x^6}}{8x^4}-\left((-1)^{1/6}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Bigg/\left(4\times 2^{2/3}\times 3^{1/4}\sqrt{2+x^6}\right)$$

Problem 1400: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^9}{\sqrt{2+x^6}}\,dx$$

Optimal (type 4, 378 leaves, 5 steps):

$$\frac{1}{7}x^4\sqrt{2+x^6}-\frac{8\sqrt{2+x^6}}{7\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)}+\left(4\times 2^{1/6}\times 3^{1/4}\sqrt{2-\sqrt{3}}\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],-7-4\sqrt{3}\right]\right)\Big/\left(7\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)-$$
$$\left(8\times 2^{2/3}\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\right.\right.$$
$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(7\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)$$

Result (type 4, 189 leaves) :

$$\frac{1}{7}x^4\sqrt{2+x^6}+\frac{1}{7\times 3^{1/4}\sqrt{2+x^6}}8\,\mathrm{i}\,2^{2/3}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}$$
$$\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\left(-\mathrm{i}\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$
$$\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 1401: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^3}{\sqrt{2+x^6}}\,dx$$

Optimal (type 4, 354 leaves, 4 steps) :

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

$$\left(3^{1/4}\sqrt{2-\sqrt{3}}\,\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\right.\right.$$

$$\left.\left.-7-4\sqrt{3}\right]\right)\Bigg/\left(2^{5/6}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\sqrt{2+x^6}\right)+$$

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

$$\left(3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\sqrt{2+x^6}\right)$$

Result (type 4, 170 leaves):

$$-\frac{1}{3^{1/4}\sqrt{2+x^6}}\,\mathrm{i}\,2^{2/3}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\;\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}$$

$$\left(-\mathrm{i}\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$

$$\left.(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 1402: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^3\sqrt{2+x^6}}\,dx$$

Optimal (type 4, 378 leaves, 5 steps):

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

$$\left(3^{1/4}\sqrt{2-\sqrt{3}}\,\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\right.\right.$$

$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(4\times 2^{5/6}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\sqrt{2+x^6}\right)+$$

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

$$\left(2\times 2^{1/3}\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\sqrt{2+x^6}\right)$$

Result (type 4, 189 leaves):

$$-\frac{\sqrt{2+x^6}}{4\,x^2}-\left(\mathbb{i}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\;\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\right.$$

$$\left(-\mathbb{i}\sqrt{3}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+\right.$$

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

Problem 1418: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{13}}{\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 202 leaves, 4 steps):

$$-\frac{x^8}{3\sqrt{2+x^6}}+\frac{8}{15}x^2\sqrt{2+x^6}-$$
$$\left(16\times 2^{5/6}\sqrt{2+\sqrt{3}}\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\right.\right.$$
$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(15\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)$$

Result (type 4, 144 leaves):

$$\frac{1}{45\sqrt{2+x^6}}\left(48x^2+9x^8-16\left(-1\right)^{1/6}2^{1/3}\times 3^{3/4}\sqrt{-\left(-1\right)^{1/6}\left(2\left(-1\right)^{2/3}+2^{2/3}x^2\right)}\right.$$
$$\left.\sqrt{2+\left(-1\right)^{1/3}2^{2/3}x^2+\left(-1\right)^{2/3}2^{1/3}x^4}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2+2^{2/3}x^2\right)}}{2\times 3^{1/4}}\right],\left(-1\right)^{1/3}\right]\right)$$

Problem 1419: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^7}{\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 186 leaves, 3 steps):

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

Result (type 4, 136 leaves):

$$-\frac{x^2}{3\sqrt{2+x^6}}+\frac{1}{3\times 3^{1/4}\sqrt{2+x^6}}2\,(-1)^{1/6}\,2^{1/3}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}$$
$$\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]$$

Problem 1420: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x}{\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 186 leaves, 3 steps):

$$\frac{x^2}{6\sqrt{2+x^6}}+\left(\sqrt{2+\sqrt{3}}\,\left(2^{1/3}+x^2\right)\right.$$
$$\left.\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\,-7-4\sqrt{3}\right]\right)\Bigg/$$
$$\left(6\times 2^{1/6}\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\;\sqrt{2+x^6}\right)$$

Result (type 4, 136 leaves):

$$\frac{x^2}{6\sqrt{2+x^6}}+\left((-1)^{1/6}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\;\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Bigg/\left(3\times 2^{2/3}\times 3^{1/4}\sqrt{2+x^6}\right)$$

Problem 1421: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^5\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 202 leaves, 4 steps):

$$\frac{1}{6x^4\sqrt{2+x^6}}-\frac{7\sqrt{2+x^6}}{48x^4}-$$
$$\left(7\sqrt{2+\sqrt{3}}\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],\right.\right.$$
$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(48\times 2^{1/6}\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)$$

Result (type 4, 146 leaves):

$$-\frac{1}{288x^4\sqrt{2+x^6}}\left(36+42x^6+\right.$$
$$7(-1)^{1/6}2^{1/3}\times 3^{3/4}x^4\sqrt{-(-1)^{1/6}\left(2(-1)^{2/3}+2^{2/3}x^2\right)}\sqrt{2+(-1)^{1/3}2^{2/3}x^2+(-1)^{2/3}2^{1/3}x^4}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2+2^{2/3}x^2\right)}}{2\times 3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 1426: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{15}}{\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 394 leaves, 6 steps):

$$-\frac{x^{10}}{3\sqrt{2+x^6}}+\frac{10}{21}x^4\sqrt{2+x^6}-\frac{80\sqrt{2+x^6}}{21\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)}+$$

$$\left(40\times 2^{1/6}\sqrt{2-\sqrt{3}}\left(2^{1/3}+x^2\right)\sqrt{\frac{2^{2/3}-2^{1/3}x^2+x^4}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{1/3}\left(1-\sqrt{3}\right)+x^2}{2^{1/3}\left(1+\sqrt{3}\right)+x^2}\right],-7-4\sqrt{3}\right]\right)\Bigg/$$

$$\left(7\times 3^{3/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)-\left(80\times 2^{2/3}\left(2^{1/3}+x^2\right)\right.$$

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

$$\left(21\times 3^{1/4}\sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3}\left(1+\sqrt{3}\right)+x^2\right)^2}}\sqrt{2+x^6}\right)$$

Result (type 4, 195 leaves):

$$\frac{1}{63\sqrt{2+x^6}}\left(3x^4\left(20+3x^6\right)+\right.$$

$$40\times 2^{2/3}\times 3^{3/4}\sqrt{-(-1)^{1/6}\left(2(-1)^{2/3}+2^{2/3}x^2\right)}\sqrt{2+(-1)^{1/3}2^{2/3}x^2+(-1)^{2/3}2^{1/3}x^4}$$

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

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

Problem 1427: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^9}{\left(2+x^6\right)^{3/2}}\, dx$$

Optimal (type 4, 376 leaves, 5 steps):

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

Result (type 4, 177 leaves):

$$\frac{1}{9\sqrt{2+x^6}}\left(-3x^4-4\times 2^{2/3}\times 3^{3/4}\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2+2^{2/3}x^2\right)}}{2\times 3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2+2^{2/3}x^2\right)}}{2\times 3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 1428: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^3}{\left(2+x^6\right)^{3/2}}\,dx$$

Optimal (type 4, 378 leaves, 5 steps):

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

Result (type 4, 189 leaves):

$$\frac{x^4}{6\sqrt{2+x^6}}+\left(i\sqrt{(-1)^{5/6}\left(-1+\left(-\frac{1}{2}\right)^{1/3}x^2\right)}\sqrt{1+\left(-\frac{1}{2}\right)^{1/3}x^2+\left(-\frac{1}{2}\right)^{2/3}x^4}\left(-i\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{(-1)^{5/6}x^2}{2^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(3\times 2^{1/3}\times 3^{1/4}\sqrt{2+x^6}\right)$$

Problem 1429: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^3 \left(2+x^6\right)^{3/2}} \, dx$$

Optimal (type 4, 394 leaves, 6 steps):

$$\frac{1}{6 x^2 \sqrt{2+x^6}}-\frac{5 \sqrt{2+x^6}}{24 x^2}+\frac{5 \sqrt{2+x^6}}{24 \left(2^{1/3} \left(1+\sqrt{3}\right)+x^2\right)}-$$
$$\left(5 \sqrt{2-\sqrt{3}} \left(2^{1/3}+x^2\right) \sqrt{\frac{2^{2/3}-2^{1/3} x^2+x^4}{\left(2^{1/3} \left(1+\sqrt{3}\right)+x^2\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{1/3} \left(1-\sqrt{3}\right)+x^2}{2^{1/3} \left(1+\sqrt{3}\right)+x^2}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(8\times 2^{5/6}\times 3^{3/4} \sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3} \left(1+\sqrt{3}\right)+x^2\right)^2}} \sqrt{2+x^6}\right)+$$
$$\left(5 \left(2^{1/3}+x^2\right) \sqrt{\frac{2^{2/3}-2^{1/3} x^2+x^4}{\left(2^{1/3} \left(1+\sqrt{3}\right)+x^2\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{1/3} \left(1-\sqrt{3}\right)+x^2}{2^{1/3} \left(1+\sqrt{3}\right)+x^2}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(12\times 2^{1/3}\times 3^{1/4} \sqrt{\frac{2^{1/3}+x^2}{\left(2^{1/3} \left(1+\sqrt{3}\right)+x^2\right)^2}} \sqrt{2+x^6}\right)$$

Result (type 4, 198 leaves):

$$\frac{1}{72\, x^2 \sqrt{2+x^6}} \, \mathrm{i} \left(6\, \mathrm{i}\, x^6 + 9\, \mathrm{i} \left(2+x^6\right) + 5\, \mathrm{i}\, 2^{2/3} \times 3^{3/4}\, x^2 \sqrt{(-1)^{5/6} \left(-1+\left(-\frac{1}{2}\right)^{1/3} x^2\right)} \sqrt{1+\left(-\frac{1}{2}\right)^{1/3} x^2+\left(-\frac{1}{2}\right)^{2/3} x^4} \left(\sqrt{3}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-\mathrm{i}+\sqrt{3}\right)\left(2+2^{2/3} x^2\right)}}{2\times 3^{1/4}}\right], (-1)^{1/3}\right] + (-1)^{5/6}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\left(-\mathrm{i}+\sqrt{3}\right)\left(2+2^{2/3} x^2\right)}}{2\times 3^{1/4}}\right], (-1)^{1/3}\right]\right)\right)$$

Problem 1456: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^5 \left(a+b\, x^8\right)} \, dx$$

Optimal (type 3, 40 leaves, 3 steps):

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

Result (type 3, 164 leaves):

$$\frac{1}{4\, a^{3/2}\, x^4} \left(-\sqrt{a} + \sqrt{b}\, x^4\, \text{ArcTan}\left[\text{Cot}\left[\frac{\pi}{8}\right] - \frac{b^{1/8}\, x\, \text{Csc}\left[\frac{\pi}{8}\right]}{a^{1/8}}\right] + \sqrt{b}\, x^4\, \text{ArcTan}\left[\text{Cot}\left[\frac{\pi}{8}\right] + \frac{b^{1/8}\, x\, \text{Csc}\left[\frac{\pi}{8}\right]}{a^{1/8}}\right] + \sqrt{b}\, x^4\, \text{ArcTan}\left[\frac{b^{1/8}\, x\, \text{Sec}\left[\frac{\pi}{8}\right]}{a^{1/8}} - \text{Tan}\left[\frac{\pi}{8}\right]\right] - \sqrt{b}\, x^4\, \text{ArcTan}\left[\frac{b^{1/8}\, x\, \text{Sec}\left[\frac{\pi}{8}\right]}{a^{1/8}} + \text{Tan}\left[\frac{\pi}{8}\right]\right]\right)$$

Problem 1472: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3}{1-x^8} \, dx$$

Optimal (type 3, 8 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[x^4\right]}{4}$$

Result (type 3, 23 leaves):

$$-\frac{1}{8}\,\text{Log}\left[1-x^4\right]+\frac{1}{8}\,\text{Log}\left[1+x^4\right]$$

Problem 1494: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^3\,\left(1+x^8\right)}\,dx$$

Optimal (type 3, 100 leaves, 11 steps):

$$-\frac{1}{2\,x^2}+\frac{\text{ArcTan}\left[1-\sqrt{2}\,x^2\right]}{4\,\sqrt{2}}-\frac{\text{ArcTan}\left[1+\sqrt{2}\,x^2\right]}{4\,\sqrt{2}}-\frac{\text{Log}\left[1-\sqrt{2}\,x^2+x^4\right]}{8\,\sqrt{2}}+\frac{\text{Log}\left[1+\sqrt{2}\,x^2+x^4\right]}{8\,\sqrt{2}}$$

Result (type 3, 208 leaves):

$$-\frac{1}{2\,x^2}-\frac{\text{ArcTan}\left[\left(x-\text{Cos}\left[\frac{\pi}{8}\right]\right)\,\text{Csc}\left[\frac{\pi}{8}\right]\right]}{4\,\sqrt{2}}+\frac{\text{ArcTan}\left[\left(x+\text{Cos}\left[\frac{\pi}{8}\right]\right)\,\text{Csc}\left[\frac{\pi}{8}\right]\right]}{4\,\sqrt{2}}-$$
$$\frac{\text{ArcTan}\left[\text{Sec}\left[\frac{\pi}{8}\right]\,\left(x-\text{Sin}\left[\frac{\pi}{8}\right]\right)\right]}{4\,\sqrt{2}}+\frac{\text{ArcTan}\left[\text{Sec}\left[\frac{\pi}{8}\right]\,\left(x+\text{Sin}\left[\frac{\pi}{8}\right]\right)\right]}{4\,\sqrt{2}}-\frac{\text{Log}\left[1+x^2-2\,x\,\text{Cos}\left[\frac{\pi}{8}\right]\right]}{8\,\sqrt{2}}-$$
$$\frac{\text{Log}\left[1+x^2+2\,x\,\text{Cos}\left[\frac{\pi}{8}\right]\right]}{8\,\sqrt{2}}+\frac{\text{Log}\left[1+x^2-2\,x\,\text{Sin}\left[\frac{\pi}{8}\right]\right]}{8\,\sqrt{2}}+\frac{\text{Log}\left[1+x^2+2\,x\,\text{Sin}\left[\frac{\pi}{8}\right]\right]}{8\,\sqrt{2}}$$

Problem 1508: Result unnecessarily involves higher level functions.

$$\int x\,\sqrt{1+x^8}\,dx$$

Optimal (type 4, 62 leaves, 3 steps):

$$\frac{1}{6}\,x^2\,\sqrt{1+x^8}+\frac{\left(1+x^4\right)\,\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[x^2\right],\,\frac{1}{2}\right]}{6\,\sqrt{1+x^8}}$$

Result (type 5, 34 leaves):

$$\frac{1}{6}\,x^2\,\left(\sqrt{1+x^8}+2\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,-x^8\right]\right)$$

Problem 1510: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{1+x^8}}{x^3}\,dx$$

Optimal (type 4, 125 leaves, 5 steps):

$$-\frac{\sqrt{1+x^8}}{2x^2}+\frac{x^2\sqrt{1+x^8}}{1+x^4}-\frac{\left(1+x^4\right)\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{\sqrt{1+x^8}}+\frac{\left(1+x^4\right)\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{2\sqrt{1+x^8}}$$

Result (type 5, 39 leaves):

$$-\frac{\sqrt{1+x^8}}{2x^2}+\frac{1}{3}x^6\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-x^8\right]$$

Problem 1522: Result unnecessarily involves higher level functions.

$$\int\frac{x^{13}}{\sqrt{1+x^8}}\,dx$$

Optimal (type 4, 130 leaves, 5 steps):

$$\frac{1}{10}x^6\sqrt{1+x^8}-\frac{3x^2\sqrt{1+x^8}}{10\left(1+x^4\right)}+\frac{3\left(1+x^4\right)\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{10\sqrt{1+x^8}}-\frac{3\left(1+x^4\right)\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{20\sqrt{1+x^8}}$$

Result (type 5, 34 leaves):

$$\frac{1}{10}x^6\left(\sqrt{1+x^8}-\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-x^8\right]\right)$$

Problem 1523: Result unnecessarily involves higher level functions.

$$\int\frac{x^{9}}{\sqrt{1+x^8}}\,dx$$

Optimal (type 4, 62 leaves, 3 steps):

$$\frac{1}{6}x^2\sqrt{1+x^8}-\frac{\left(1+x^4\right)\sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{12\sqrt{1+x^8}}$$

Result (type 5, 34 leaves):

$$\frac{1}{6}x^2\left(\sqrt{1+x^8}-\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-x^8\right]\right)$$

Problem 1524: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\sqrt{1+x^8}} \, dx$$

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

$$\frac{x^2 \sqrt{1+x^8}}{2 \left(1+x^4\right)} - \frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}} \text{ EllipticE}\left[2 \text{ ArcTan}\left[x^2\right], \frac{1}{2}\right]}{2 \sqrt{1+x^8}} + \frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}} \text{ EllipticF}\left[2 \text{ ArcTan}\left[x^2\right], \frac{1}{2}\right]}{4 \sqrt{1+x^8}}$$

Result (type 5, 22 leaves):

$$\frac{1}{6} x^6 \text{ Hypergeometric2F1}\left[\frac{1}{2}, \frac{3}{4}, \frac{7}{4}, -x^8\right]$$

Problem 1525: Result unnecessarily involves higher level functions.

$$\int \frac{x}{\sqrt{1+x^8}} \, dx$$

Optimal (type 4, 45 leaves, 2 steps):

$$\frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}} \text{ EllipticF}\left[2 \text{ ArcTan}\left[x^2\right], \frac{1}{2}\right]}{4 \sqrt{1+x^8}}$$

Result (type 5, 22 leaves):

$$\frac{1}{2} x^2 \text{ Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -x^8\right]$$

Problem 1526: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 \sqrt{1+x^8}} \, dx$$

Optimal (type 4, 130 leaves, 5 steps):

$$-\frac{\sqrt{1+x^8}}{2 x^2}+\frac{x^2 \sqrt{1+x^8}}{2 \left(1+x^4\right)}-\frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticE}\left[2 \,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{2 \sqrt{1+x^8}}+\frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticF}\left[2 \,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{4 \sqrt{1+x^8}}$$

Result (type 5, 39 leaves):

$$-\frac{\sqrt{1+x^8}}{2 x^2}+\frac{1}{6} x^6 \,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-x^8\right]$$

Problem 1527: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^7 \sqrt{1+x^8}}\, dx$$

Optimal (type 4, 62 leaves, 3 steps):

$$-\frac{\sqrt{1+x^8}}{6 x^6}-\frac{\left(1+x^4\right) \sqrt{\frac{1+x^8}{\left(1+x^4\right)^2}}\ \text{EllipticF}\left[2 \,\text{ArcTan}\left[x^2\right],\frac{1}{2}\right]}{12 \sqrt{1+x^8}}$$

Result (type 5, 36 leaves):

$$-\frac{\sqrt{1+x^8}+x^8 \,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-x^8\right]}{6 x^6}$$

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

$$\int \frac{x^4}{\sqrt{-2+x^{10}}}\, dx$$

Optimal (type 3, 18 leaves, 3 steps):

$$\frac{1}{5} \,\text{ArcTanh}\left[\frac{x^5}{\sqrt{-2+x^{10}}}\right]$$

Result (type 3, 42 leaves):

$$-\frac{1}{10} \,\text{Log}\left[1-\frac{x^5}{\sqrt{-2+x^{10}}}\right]+\frac{1}{10} \,\text{Log}\left[1+\frac{x^5}{\sqrt{-2+x^{10}}}\right]$$

Problem 1576: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 16 leaves, 1 step):

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

Result (type 1, 39 leaves):

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

Problem 1586: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 47 leaves, 3 steps):

$$\frac{b^2 (b+a x)^9}{9 a^3}-\frac{b (b+a x)^{10}}{5 a^3}+\frac{(b+a x)^{11}}{11 a^3}$$

Result (type 1, 102 leaves):

$$\frac{b^8 x^3}{3}+2 a b^7 x^4+\frac{28}{5} a^2 b^6 x^5+\frac{28}{3} a^3 b^5 x^6+10 a^4 b^4 x^7+7 a^5 b^3 x^8+\frac{28}{9} a^6 b^2 x^9+\frac{4}{5} a^7 b x^{10}+\frac{a^8 x^{11}}{11}$$

Problem 1587: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 30 leaves, 3 steps):

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

Result (type 1, 104 leaves):

$$\frac{b^8 x^2}{2}+\frac{8}{3} a b^7 x^3+7 a^2 b^6 x^4+\frac{56}{5} a^3 b^5 x^5+\frac{35}{3} a^4 b^4 x^6+8 a^5 b^3 x^7+\frac{7}{2} a^6 b^2 x^8+\frac{8}{9} a^7 b x^9+\frac{a^8 x^{10}}{10}$$

Problem 1598: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+\frac{b}{x}\right)^8}{x^2} \, dx$$

Optimal (type 1, 16 leaves, 1 step):

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

Result (type 1, 96 leaves):

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

Problem 1599: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+\frac{b}{x}\right)^8}{x^3}\,dx$$

Optimal (type 1, 36 leaves, 3 steps):

$$-\frac{(b+a\,x)^9}{10\,b\,x^{10}}+\frac{a\,(b+a\,x)^9}{90\,b^2\,x^9}$$

Result (type 1, 104 leaves):

$$-\frac{b^8}{10\,x^{10}}-\frac{8\,a\,b^7}{9\,x^9}-\frac{7\,a^2\,b^6}{2\,x^8}-\frac{8\,a^3\,b^5}{x^7}-\frac{35\,a^4\,b^4}{3\,x^6}-\frac{56\,a^5\,b^3}{5\,x^5}-\frac{7\,a^6\,b^2}{x^4}-\frac{8\,a^7\,b}{3\,x^3}-\frac{a^8}{2\,x^2}$$

Problem 1837: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 16 leaves, 1 step):

$$-\frac{\left(a+\frac{b}{x^2}\right)^4}{8\,b}$$

Result (type 1, 43 leaves):

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

Problem 1915: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}\;x}\,dx$$

Optimal (type 3, 24 leaves, 3 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 50 leaves):

$$\frac{\sqrt{b+a x^2}\ \text{ArcTanh}\left[\frac{\sqrt{a}\ x}{\sqrt{b+a x^2}}\right]}{\sqrt{a}\ \sqrt{a+\frac{b}{x^2}}\ x}$$

Problem 1925: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 27 leaves, 3 steps):

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

Result (type 3, 56 leaves):

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

Problem 1926: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 20 leaves, 2 steps):

$$-\frac{\text{ArcCsch}\left[\frac{\sqrt{2}\ x}{\sqrt{b}}\right]}{\sqrt{b}}$$

Result (type 3, 56 leaves):

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

Problem 1927: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 20 leaves, 2 steps):

$$-\frac{\text{ArcCsc}\left[\frac{\sqrt{2}\ x}{\sqrt{b}}\right]}{\sqrt{b}}$$

Result (type 3, 64 leaves):

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

Problem 1957: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 44 leaves, 2 steps):

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

Result (type 5, 100 leaves):

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

Problem 1960: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 44 leaves, 2 steps):

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

Result (type 5, 91 leaves):

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

Problem 1996: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{a+\frac{b}{x^3}}\,x^7\,dx$$

Optimal (type 4, 291 leaves, 5 steps):

$$-\frac{21\,b^2\sqrt{a+\frac{b}{x^3}}\,x^2}{320\,a^2}+\frac{3\,b\sqrt{a+\frac{b}{x^3}}\,x^5}{80\,a}+\frac{1}{8}\sqrt{a+\frac{b}{x^3}}\,x^8-\left(7\times 3^{3/4}\sqrt{2+\sqrt{3}}\,b^{8/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(320\,a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 207 leaves):

$$\left(\sqrt{a+\frac{b}{x^3}}\,x^2\left((-b)^{1/3}\left(-21\,b^3-9\,a\,b^2\,x^3+52\,a^2\,b\,x^6+40\,a^3\,x^9\right)-7\,i\,3^{3/4}\,a^{1/3}\,b^3\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\,x\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}x}{a^{1/3}}+x^2}{x^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Bigg/\left(320\,a^2\,(-b)^{1/3}\left(b+a\,x^3\right)\right)$$

Problem 1997: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{a+\frac{b}{x^3}}\, x^4\, dx$$

Optimal (type 4, 267 leaves, 4 steps):

$$\frac{3 b \sqrt{a+\frac{b}{x^3}}\, x^2}{20 a}+\frac{1}{5} \sqrt{a+\frac{b}{x^3}}\, x^5+\left(3^{3/4} \sqrt{2+\sqrt{3}}\, b^{5/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right) \sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3} b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4 \sqrt{3}\right]\right) \Big/ \left(20 a \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 196 leaves):

$$\left(\sqrt{a+\frac{b}{x^3}}\, x^2 \left((-b)^{1/3} \left(3 b^2+7 a b x^3+4 a^2 x^6\right)+ i\, 3^{3/4} a^{1/3} b^2 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3}}{a^{1/3} x}\right)}\, x \sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3} x}{a^{1/3}}+x^2}{x^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3}}{a^{1/3} x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right) \Big/ \left(20 a (-b)^{1/3} \left(b+a x^3\right)\right)$$

Problem 1998: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 242 leaves, 3 steps):

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

Result (type 4, 162 leaves):

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

Problem 1999: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+\frac{b}{x^3}}}{x^2}\,dx$$

Optimal (type 4, 243 leaves, 3 steps):

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

Result (type 4, 164 leaves):

$$\frac{1}{5\,x}2\sqrt{a+\frac{b}{x^3}}\left(-1-\left(\mathrm{i}\,3^{3/4}\,a^{4/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x^4\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left((-b)^{1/3}\left(b+a\,x^3\right)\right)\right)$$

Problem 2000: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 267 leaves, 4 steps):

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

Result (type 4, 192 leaves):

$$\left(2\sqrt{a+\frac{b}{x^3}}\left((-b)^{1/3}\left(5\,b^2+8\,a\,b\,x^3+3\,a^2\,x^6\right)-2\,i\,3^{3/4}\,a^{7/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x^7\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)\Bigg/\left(55\,(-b)^{4/3}\,x^4\left(b+a\,x^3\right)\right)$$

Problem 2001: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+\frac{b}{x^3}}}{x^8}\,dx$$

Optimal (type 4, 291 leaves, 5 steps):

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{17\,x^7}-\frac{6\,a\sqrt{a+\frac{b}{x^3}}}{187\,b\,x^4}+\frac{48\,a^2\sqrt{a+\frac{b}{x^3}}}{935\,b^2\,x}-\left(32\times 3^{3/4}\sqrt{2+\sqrt{3}}\;a^3\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4\sqrt{3}\right]\right)\Big/\left(935\,b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 203 leaves):

$$\left(2\sqrt{a+\frac{b}{x^3}}\left((-b)^{1/3}\left(-55\,b^3-70\,a\,b^2\,x^3+9\,a^2\,b\,x^6+24\,a^3\,x^9\right)-16\,i\,3^{3/4}\,a^{10/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x^{10}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(935\,(-b)^{7/3}\,x^7\left(b+a\,x^3\right)\right)$$

Problem 2002: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{a+\frac{b}{x^3}}\;x^6\,dx$$

Optimal (type 4, 563 leaves, 7 steps):

$$\frac{15\, b^{7/3} \sqrt{a+\frac{b}{x^3}}}{112\, a^2 \left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)} - \frac{15\, b^2 \sqrt{a+\frac{b}{x^3}}\, x}{112\, a^2} +$$

$$\frac{3\, b \sqrt{a+\frac{b}{x^3}}\, x^4}{56\, a} + \frac{1}{7} \sqrt{a+\frac{b}{x^3}}\, x^7 - \left(15 \times 3^{1/4} \sqrt{2-\sqrt{3}}\, b^{7/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(224\, a^{5/3} \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right) + \left(5 \times 3^{3/4}\, b^{7/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(56 \sqrt{2}\, a^{5/3} \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 375 leaves) :

$$\frac{1}{112\,a^2}\sqrt{a+\frac{b}{x^3}}\,x\left(-\frac{15\,a^{1/3}\,b^2\,x}{b^{1/3}+a^{1/3}\,x}+2\,a\,x^3\,\left(3\,b+8\,a\,x^3\right)-\right.$$

$$\left(15\,(-1)^{2/3}\,b^{7/3}\,\left(b^{1/3}+a^{1/3}\,x\right)\sqrt{\frac{\left(1+(-1)^{1/3}\right)a^{1/3}\,x\,\left(b^{1/3}-(-1)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}\right.$$

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

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

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

Problem 2003: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 539 leaves, 6 steps):

$$-\frac{3\,b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8\,a\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{3\,b\,\sqrt{a+\frac{b}{x^3}}\,x}{8\,a}+\frac{1}{4}\sqrt{a+\frac{b}{x^3}}\,x^4+$$

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

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

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

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

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

Result (type 4, 359 leaves):

$$\frac{1}{8}\sqrt{a+\frac{b}{x^3}}\,x\left(2x^3+\frac{3\,b\,x}{a^{2/3}\,b^{1/3}+a\,x}+\left(3\,(-1)^{2/3}\,b^{4/3}\,\left(b^{1/3}+a^{1/3}\,x\right)\sqrt{\frac{\left(1+(-1)^{1/3}\right)a^{1/3}\,x\,\left(b^{1/3}-(-1)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}\right.\right.$$

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\left(\left(-3-\mathrm{i}\sqrt{3}\right)\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left(1+\mathrm{i}\sqrt{3}\right)\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)\Big/$$

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

Problem 2004: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 507 leaves, 5 steps):

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

$$\left(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\; a^{1/3}\, b^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\, b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\; \text{EllipticE}\left[\right.\right.$$

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

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

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

Result (type 4, 351 leaves) :

$$\sqrt{a+\frac{b}{x^3}}\ x$$

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

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\,\left(\left(-3-\mathrm{i}\,\sqrt{3}\right)\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left(1+\mathrm{i}\,\sqrt{3}\right)\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)\Big/$$

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

Problem 2005: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 517 leaves, 5 steps):

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

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

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

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

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

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

Result (type 4, 366 leaves) :

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

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\left(\left(-3-\mathrm{i}\sqrt{3}\right)\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left(1+\mathrm{i}\sqrt{3}\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)\Bigg/$$

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

Problem 2006: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^6}\,dx$$

Optimal (type 4, 541 leaves, 6 steps) :

$$\frac{24\,a^2\sqrt{a+\frac{b}{x^3}}}{91\,b^{5/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13\,x^5}-\frac{6\,a\sqrt{a+\frac{b}{x^3}}}{91\,b\,x^2}-$$

$$\left(12\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(91\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(8\sqrt{2}\;3^{3/4}\,a^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(91\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 377 leaves) :

$$\frac{1}{91\,b^2}2\sqrt{a+\frac{b}{x^3}}\;x\left(12\,a^2-\frac{7\,b^2}{x^6}-\frac{3\,a\,b}{x^3}-\frac{12\,a^{7/3}\,x}{b^{1/3}+a^{1/3}\,x}-\right.$$

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

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\left(\left(-3-\mathrm{i}\,\sqrt{3}\right)\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

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

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

Problem 2007: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+\frac{b}{x^3}}}{x^9}\,dx$$

Optimal (type 4, 565 leaves, 7 steps):

$$-\frac{240\,a^3\sqrt{a+\frac{b}{x^3}}}{1729\,b^{8/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19\,x^8}-$$

$$\frac{6\,a\sqrt{a+\frac{b}{x^3}}}{247\,b\,x^5}+\frac{60\,a^2\sqrt{a+\frac{b}{x^3}}}{1729\,b^2\,x^2}+\left(120\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{10/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(1729\,b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(80\sqrt{2}\;3^{3/4}\,a^{10/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(1729\,b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 388 leaves) :

$$\frac{1}{1729\, b^3} 2 \sqrt{a+\frac{b}{x^3}}\, x \left(-120\, a^3-\frac{91\, b^3}{x^9}-\frac{21\, a\, b^2}{x^6}+\frac{30\, a^2\, b}{x^3}+\frac{120\, a^{10/3}\, x}{b^{1/3}+a^{1/3}\, x}+\right.$$

$$\left(60\, (-1)^{2/3}\, a^3\, b^{1/3}\, \left(b^{1/3}+a^{1/3}\, x\right) \sqrt{\frac{\left(1+(-1)^{1/3}\right) a^{1/3}\, x \left(b^{1/3}-(-1)^{1/3}\, a^{1/3}\, x\right)}{\left(b^{1/3}+a^{1/3}\, x\right)^2}}\right.$$

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

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

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

Problem 2017: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\, x}\, dx$$

Optimal (type 3, 27 leaves, 3 steps):

$$\frac{2\, \text{ArcTanh}\left[\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right]}{3\sqrt{a}}$$

Result (type 3, 59 leaves):

$$\frac{2\sqrt{b+a\, x^3}\; \text{ArcTanh}\left[\frac{\sqrt{a}\, x^{3/2}}{\sqrt{b+a\, x^3}}\right]}{3\sqrt{a}\, \sqrt{a+\frac{b}{x^3}}\, x^{3/2}}$$

Problem 2022: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

$$\frac{91 b^2 \sqrt{a+\frac{b}{x^3}}\, x^2}{320 a^3}-\frac{13 b \sqrt{a+\frac{b}{x^3}}\, x^5}{80 a^2}+\frac{\sqrt{a+\frac{b}{x^3}}\, x^8}{8 a}+\left(91 \sqrt{2+\sqrt{3}}\, b^{8/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right) \sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3} b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4 \sqrt{3}\right]\right)\Bigg/\left(320\times 3^{1/4} a^3 \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 199 leaves):

$$\left(3 (-b)^{1/3} \left(91 b^3+39 a b^2 x^3-12 a^2 b x^6+40 a^3 x^9\right)+91\, i\, 3^{3/4} a^{1/3} b^3 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3}}{a^{1/3} x}\right)}\ x \sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3} x}{a^{1/3}}+x^2}{x^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3}}{a^{1/3} x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Bigg/\left(960 a^3 (-b)^{1/3} \sqrt{a+\frac{b}{x^3}}\ x\right)$$

Problem 2023: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Optimal (type 4, 270 leaves, 4 steps):

$$-\frac{7 b \sqrt{a+\frac{b}{x^3}}\, x^2}{20 a^2}+\frac{\sqrt{a+\frac{b}{x^3}}\, x^5}{5 a}-\left(7 \sqrt{2+\sqrt{3}}\, b^{5/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right) \sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3} b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}}\right],\ -7-4 \sqrt{3}\right]\right)\Bigg/\left(20\times 3^{1/4} a^2 \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 188 leaves):

$$\left(-3 (-b)^{1/3} \left(7 b^2+3 a b x^3-4 a^2 x^6\right)-7\, i\, 3^{3/4} a^{1/3} b^2 \sqrt{(-1)^{5/6} \left(-1+\frac{(-b)^{1/3}}{a^{1/3} x}\right)}\, x \sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3} x}{a^{1/3}}+x^2}{x^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-b)^{1/3}}{a^{1/3} x}}}{3^{1/4}}\right],\ (-1)^{1/3}\right]\right)\Bigg/\left(60 a^2 (-b)^{1/3} \sqrt{a+\frac{b}{x^3}}\, x\right)$$

Problem 2024: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 248 leaves, 3 steps):

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

Result (type 4, 174 leaves):

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

Problem 2025: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 221 leaves, 2 steps):

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

Result (type 4, 142 leaves):

$$-\left(\left(2\,\mathrm{i}\,a^{1/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\,\sqrt{1+\frac{(-b)^{2/3}}{a^{2/3}\,x^2}+\frac{(-b)^{1/3}}{a^{1/3}\,x}}\right.\right.$$

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\middle/\left(3^{1/4}\,(-b)^{1/3}\,\sqrt{a+\frac{b}{x^3}}\right)\right)$$

Problem 2026: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^3}}\;x^5}\,dx$$

Optimal (type 4, 246 leaves, 3 steps):

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{5\,b\,x}+\left(4\sqrt{2+\sqrt{3}}\;a\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(5\times3^{1/4}\,b^{4/3}\sqrt{a+\frac{b}{x^3}}\;\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 170 leaves):

$$-\left(\left(-6\,(-b)^{1/3}\left(b+a\,x^3\right)+4\,\mathrm{i}\,3^{3/4}\,a^{4/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x^4\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\right.\right.$$

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\middle/\left(15\,(-b)^{4/3}\sqrt{a+\frac{b}{x^3}}\;x^4\right)\right)$$

Problem 2027: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\, x^8}\, dx$$

Optimal (type 4, 270 leaves, 4 steps):

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{11\, b\, x^4}+\frac{16\, a\sqrt{a+\frac{b}{x^3}}}{55\, b^2\, x}-\left(32\sqrt{2+\sqrt{3}}\, a^2\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\, b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],\; -7-4\sqrt{3}\right]\right)\Bigg/\left(55\times 3^{1/4}\, b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 184 leaves):

$$\left(6\,(-b)^{1/3}\left(-5\, b^2+3\, a\, b\, x^3+8\, a^2\, x^6\right)-32\, i\, 3^{3/4}\, a^{7/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\, x}\right)}\; x^7\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\, x}{a^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\, x}}}{3^{1/4}}\right],\;(-1)^{1/3}\right]\right)\Bigg/\left(165\,(-b)^{7/3}\sqrt{a+\frac{b}{x^3}}\; x^7\right)$$

Problem 2028: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a+\frac{b}{x^3}}}\, dx$$

Optimal (type 4, 566 leaves, 7 steps):

$$-\frac{55\, b^{7/3}\sqrt{a+\frac{b}{x^3}}}{112\, a^3\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{55\, b^2\sqrt{a+\frac{b}{x^3}}\; x}{112\, a^3}-$$

$$\frac{11\, b\sqrt{a+\frac{b}{x^3}}\; x^4}{56\, a^2}+\frac{\sqrt{a+\frac{b}{x^3}}\; x^7}{7\, a}+\left(55\times 3^{1/4}\sqrt{2-\sqrt{3}}\; b^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(224\, a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(55\, b^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(56\sqrt{2}\; 3^{1/4}\, a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 372 leaves) :

$$\left(55\left(a^{1/3}b^{8/3}x-a^{2/3}b^{7/3}x^2+a\,b^2x^3\right)+2\,a\,x^3\left(-11\,b^2-3\,a\,b\,x^3+8\,a^2x^6\right)+\frac{1}{2\left(-1+(-1)^{2/3}\right)}\right.$$

$$55\,(-1)^{2/3}\,b^{7/3}\left(b^{1/3}+a^{1/3}x\right)^2\sqrt{\frac{\left(1+(-1)^{1/3}\right)a^{1/3}x\left(b^{1/3}-(-1)^{1/3}a^{1/3}x\right)}{\left(b^{1/3}+a^{1/3}x\right)^2}}$$

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

$$\left.\left.\left(1+i\sqrt{3}\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)a^{1/3}x}{b^{1/3}+a^{1/3}x}}}{\sqrt{2}}\right],\frac{-i+\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\Bigg/\left(112\,a^3\sqrt{a+\frac{b}{x^3}}\,x^2\right)$$

Problem 2029: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 542 leaves, 6 steps):

$$\frac{5\,b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8\,a^2\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{5\,b\sqrt{a+\frac{b}{x^3}}\;x}{8\,a^2}+\frac{\sqrt{a+\frac{b}{x^3}}\;x^4}{4\,a}-$$

$$\left(5\times 3^{1/4}\sqrt{2-\sqrt{3}}\;b^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(16\,a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(5\,b^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(4\sqrt{2}\;3^{1/4}\,a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 356 leaves) :

$$\frac{1}{8\,a\,\sqrt{a+\frac{b}{x^3}}\,x^2}\left(5\,b\,x\left(-\frac{b^{2/3}}{a^{2/3}}+\frac{b^{1/3}\,x}{a^{1/3}}-x^2\right)+2\,x^3\,\left(b+a\,x^3\right)-\right.$$

$$\left(5\,(-1)^{2/3}\,b^{4/3}\,\left(b^{1/3}+a^{1/3}\,x\right)^2\,\sqrt{\frac{\left(1+(-1)^{1/3}\right)\,a^{1/3}\,x\,\left(b^{1/3}-(-1)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}\right.$$

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\,\left(\left(-3-\mathrm{i}\,\sqrt{3}\right)\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

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

Problem 2030: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Optimal (type 4, 513 leaves, 5 steps):

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

$$\left(3^{1/4}\sqrt{2-\sqrt{3}}\;b^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\text{EllipticE}\left[\right.\right.$$

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

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

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

Result (type 4, 334 leaves):

$$\frac{1}{\sqrt{a+\frac{b}{x^3}}\;x^2}$$

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

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

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

Problem 2031: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\, x^3}\, dx$$

Optimal (type 4, 491 leaves, 4 steps):

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

Result (type 4, 335 leaves):

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

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

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}a^{1/3}x}{b^{1/3}+a^{1/3}x}}\left(\left(-3-\mathrm{i}\sqrt{3}\right)\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}x}{b^{1/3}+a^{1/3}x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left(1+\mathrm{i}\sqrt{3}\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}x}{b^{1/3}+a^{1/3}x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)$$

Problem 2032: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^6}\,dx$$

Optimal (type 4, 520 leaves, 5 steps):

$$\frac{8\,a\,\sqrt{a+\frac{b}{x^3}}}{7\,b^{5/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2\,\sqrt{a+\frac{b}{x^3}}}{7\,b\,x^2}-$$

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

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

$$\left(7\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(8\sqrt{2}\;a^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(7\times 3^{1/4}\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 363 leaves) :

$$\frac{1}{7\,b^2\,\sqrt{a+\frac{b}{x^3}}\,x^2}$$

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

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

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

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

Problem 2033: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^9}\,dx$$

Optimal (type 4, 544 leaves, 6 steps):

$$-\frac{80\, a^2 \sqrt{a+\frac{b}{x^3}}}{91\, b^{8/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2 \sqrt{a+\frac{b}{x^3}}}{13\, b\, x^5}+\frac{20\, a \sqrt{a+\frac{b}{x^3}}}{91\, b^2\, x^2}+$$

$$\left(40\times 3^{1/4} \sqrt{2-\sqrt{3}}\; a^{7/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right) \sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3} b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(91\, b^{8/3} \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(80 \sqrt{2}\; a^{7/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(91\times 3^{1/4}\, b^{8/3} \sqrt{a+\frac{b}{x^3}} \sqrt{\frac{a^{1/3} \left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 377 leaves) :

$$\frac{1}{91\,b^3\sqrt{a+\frac{b}{x^3}}\;x^2}$$

$$2\left(40\,a^{7/3}\,x\,\left(b^{2/3}-a^{1/3}\,b^{1/3}\,x+a^{2/3}\,x^2\right)-\frac{\left(b+a\,x^3\right)\,\left(7\,b^2-10\,a\,b\,x^3+40\,a^2\,x^6\right)}{x^6}+\frac{1}{-1+\left(-1\right)^{2/3}}\right.$$

$$20\,\left(-1\right)^{2/3}\,a^2\,b^{1/3}\,\left(b^{1/3}+a^{1/3}\,x\right)^2\sqrt{\frac{\left(1+\left(-1\right)^{1/3}\right)\,a^{1/3}\,x\,\left(b^{1/3}-\left(-1\right)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}$$

$$\sqrt{\frac{b^{1/3}+\left(-1\right)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\left(\left(-3-\mathrm{i}\,\sqrt{3}\right)\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left(1+\mathrm{i}\,\sqrt{3}\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)$$

Problem 2034: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^3}}\;x^{12}}\,dx$$

Optimal (type 4, 568 leaves, 7 steps):

$$\frac{1280\, a^3 \sqrt{a+\frac{b}{x^3}}}{1729\, b^{11/3} \left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19\, b\, x^8}+$$

$$\frac{32\, a \sqrt{a+\frac{b}{x^3}}}{247\, b^2\, x^5}-\frac{320\, a^2 \sqrt{a+\frac{b}{x^3}}}{1729\, b^3\, x^2}-\left(640\times 3^{1/4}\sqrt{2-\sqrt{3}}\; a^{10/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(1729\, b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(1280\sqrt{2}\; a^{10/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(1729\times 3^{1/4}\, b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 387 leaves) :

$$\left(2\left(-640\,a^{10/3}\,x\,\left(b^{2/3}-a^{1/3}\,b^{1/3}\,x+a^{2/3}\,x^2\right)+\frac{\left(b+a\,x^3\right)\,\left(-91\,b^3+112\,a\,b^2\,x^3-160\,a^2\,b\,x^6+640\,a^3\,x^9\right)}{x^9}-\right.\right.$$

$$\frac{1}{-1+(-1)^{2/3}}320\,(-1)^{2/3}\,a^3\,b^{1/3}\,\left(b^{1/3}+a^{1/3}\,x\right)^2\,\sqrt{\frac{\left(1+(-1)^{1/3}\right)\,a^{1/3}\,x\,\left(b^{1/3}-(-1)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}$$

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

$$\left.\left.\left.\left(1+i\,\sqrt{3}\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+i\,\sqrt{3}\right)\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\,\frac{-i+\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\right)\Bigg/\left(1729\,b^4\,\sqrt{a+\frac{b}{x^3}}\,x^2\right)$$

Problem 2042: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$$

Optimal (type 4, 315 leaves, 6 steps):

$$\frac{1729\,b^2\,\sqrt{a+\frac{b}{x^3}}\,x^2}{960\,a^4}-\frac{247\,b\,\sqrt{a+\frac{b}{x^3}}\,x^5}{240\,a^3}-$$

$$\frac{2\,x^8}{3\,a\,\sqrt{a+\frac{b}{x^3}}}+\frac{19\,\sqrt{a+\frac{b}{x^3}}\,x^8}{24\,a^2}+\left(1729\,\sqrt{2+\sqrt{3}}\,b^{8/3}\,\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(960\times 3^{1/4}\,a^4\,\sqrt{a+\frac{b}{x^3}}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 199 leaves):

$$\left(3\,(-b)^{1/3}\left(1729\,b^3+741\,a\,b^2\,x^3-228\,a^2\,b\,x^6+120\,a^3\,x^9\right)+\right.$$

$$1729\,\mathrm{i}\,3^{3/4}\,a^{1/3}\,b^3\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\,x\,\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(2880\,a^4\,(-b)^{1/3}\,\sqrt{a+\frac{b}{x^3}}\,x\right)$$

Problem 2043: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 291 leaves, 5 steps):

$$-\frac{91\,b\,\sqrt{a+\frac{b}{x^3}}\,x^2}{60\,a^3}-\frac{2\,x^5}{3\,a\,\sqrt{a+\frac{b}{x^3}}}+\frac{13\,\sqrt{a+\frac{b}{x^3}}\,x^5}{15\,a^2}-$$

$$\left(91\,\sqrt{2+\sqrt{3}}\,b^{5/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(60\times 3^{1/4}\,a^3\,\sqrt{a+\frac{b}{x^3}}\,\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 188 leaves):

$$\left(-3\,(-b)^{1/3}\left(91\,b^2+39\,a\,b\,x^3-12\,a^2\,x^6\right)-\right.$$

$$91\,\mathrm{i}\,3^{3/4}\,a^{1/3}\,b^2\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x\,\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(180\,a^3\,(-b)^{1/3}\,\sqrt{a+\frac{b}{x^3}}\;x\right)$$

Problem 2044: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 269 leaves, 4 steps):

$$-\frac{2\,x^2}{3\,a\,\sqrt{a+\frac{b}{x^3}}}+\frac{7\,\sqrt{a+\frac{b}{x^3}}\;x^2}{6\,a^2}+$$

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

$$\left.\left.-7-4\,\sqrt{3}\right]\right)\Big/\left(6\times3^{1/4}\,a^2\,\sqrt{a+\frac{b}{x^3}}\,\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 175 leaves):

$$\left(3\,(-b)^{1/3}\,\left(7\,b+3\,a\,x^3\right)+7\,i\,3^{3/4}\,a^{1/3}\,b\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x\,\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(18\,a^2\,(-b)^{1/3}\,\sqrt{a+\frac{b}{x^3}}\;x\right)$$

Problem 2045: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 248 leaves, 3 steps):

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

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

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

Result (type 4, 164 leaves):

$$\left(-6\,(-b)^{1/3}-2\,i\,3^{3/4}\,a^{1/3}\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x\,\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(9\,a\,(-b)^{1/3}\,\sqrt{a+\frac{b}{x^3}}\;x\right)$$

Problem 2046: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 245 leaves, 3 steps):

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

Result (type 4, 161 leaves):

$$-\left(\left(6 \left(-b\right)^{1/3} - 4\, i\, 3^{3/4}\, a^{1/3} \sqrt{\left(-1\right)^{5/6} \left(-1+\frac{\left(-b\right)^{1/3}}{a^{1/3}\, x}\right)}\; x \sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3} x}{a^{1/3}}+x^2}{x^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\left(-1\right)^{5/6}-\frac{i\,(-b)^{1/3}}{a^{1/3}\, x}}}{3^{1/4}}\right], \left(-1\right)^{1/3}\right]\right) \Bigg/ \left(9 \left(-b\right)^{4/3} \sqrt{a+\frac{b}{x^3}}\; x\right)\right)$$

Problem 2047: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^8} \, dx$$

Optimal (type 4, 267 leaves, 4 steps):

$$\frac{2}{3\,b\,\sqrt{a+\frac{b}{x^3}}\;x^4}-\frac{16\sqrt{a+\frac{b}{x^3}}}{15\,b^2\,x}+$$

$$\left(32\sqrt{2+\sqrt{3}}\;a\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],\right.\right.$$

$$\left.\left.-7-4\sqrt{3}\right]\right)\Bigg/\left(15\times 3^{1/4}\,b^{7/3}\sqrt{a+\frac{b}{x^3}}\;\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 173 leaves):

$$\left(-6\,(-b)^{1/3}\left(3\,b+8\,a\,x^3\right)+32\,\mathrm{i}\,3^{3/4}\,a^{4/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-b)^{1/3}}{a^{1/3}\,x}\right)}\;x^4\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{(-b)^{1/3}\,x}{a^{1/3}}+x^2}{x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-b)^{1/3}}{a^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Bigg/\left(45\,(-b)^{7/3}\sqrt{a+\frac{b}{x^3}}\;x^4\right)$$

Problem 2048: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^6}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$$

Optimal (type 4, 587 leaves, 8 steps):

$$-\frac{935\,b^{7/3}\sqrt{a+\frac{b}{x^3}}}{336\,a^4\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{935\,b^2\sqrt{a+\frac{b}{x^3}}\,x}{336\,a^4}-\frac{187\,b\sqrt{a+\frac{b}{x^3}}\,x^4}{168\,a^3}-$$

$$\frac{2\,x^7}{3\,a\sqrt{a+\frac{b}{x^3}}}+\frac{17\sqrt{a+\frac{b}{x^3}}\,x^7}{21\,a^2}+\left(935\sqrt{2-\sqrt{3}}\,b^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(224\times 3^{3/4}\,a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(935\,b^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(168\sqrt{2}\,3^{1/4}\,a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 390 leaves) :

$$\left(b+a x^3\right)$$

$$\left(-224 a b^2 x^3-150 a b x^3 \left(b+a x^3\right)+48 a^2 x^6 \left(b+a x^3\right)+935 \left(a^{1/3} b^{8/3} x-a^{2/3} b^{7/3} x^2+a b^2 x^3\right)+\right.$$

$$935 (-1)^{2/3} b^{7/3} \left(b^{1/3}+a^{1/3} x\right)^2 \sqrt{\frac{\left(1+(-1)^{1/3}\right) a^{1/3} x \left(b^{1/3}-(-1)^{1/3} a^{1/3} x\right)}{\left(b^{1/3}+a^{1/3} x\right)^2}}$$

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

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

$$\left.\left.\left(2 \left(-1+(-1)^{2/3}\right)\right)\right)\right) \Big/ \left(336 a^4 \left(a+\frac{b}{x^3}\right)^{3/2} x^5\right)$$

Problem 2049: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 563 leaves, 7 steps):

$$\frac{55\, b^{4/3}\sqrt{a+\frac{b}{x^3}}}{24\, a^3\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{55\, b\sqrt{a+\frac{b}{x^3}}\; x}{24\, a^3}-$$

$$\frac{2\, x^4}{3\, a\sqrt{a+\frac{b}{x^3}}}+\frac{11\sqrt{a+\frac{b}{x^3}}\; x^4}{12\, a^2}-\left(55\sqrt{2-\sqrt{3}}\; b^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(16\times 3^{3/4}\, a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(55\, b^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(12\sqrt{2}\; 3^{1/4}\, a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 370 leaves):

$$\left((b + a x^3) \left(16 a b x^3 + 6 a x^3 (b + a x^3) - 55 (a^{1/3} b^{5/3} x - a^{2/3} b^{4/3} x^2 + a b x^3) - \right.\right.$$

$$\left(55 (-1)^{2/3} b^{4/3} (b^{1/3} + a^{1/3} x)^2 \sqrt{\frac{(1 + (-1)^{1/3}) a^{1/3} x (b^{1/3} - (-1)^{1/3} a^{1/3} x)}{(b^{1/3} + a^{1/3} x)^2}}\right.$$

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

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

$$\left.\left.\left(2 (-1 + (-1)^{2/3})\right)\right)\right) \Big/ \left(24 a^3 \left(a + \frac{b}{x^3}\right)^{3/2} x^5\right)$$

Problem 2050: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 539 leaves, 6 steps):

$$-\frac{5\,b^{1/3}\sqrt{a+\frac{b}{x^3}}}{3\,a^2\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}-\frac{2\,x}{3\,a\sqrt{a+\frac{b}{x^3}}}+\frac{5\sqrt{a+\frac{b}{x^3}}\;x}{3\,a^2}+$$

$$\left(5\sqrt{2-\sqrt{3}}\;b^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(2\times 3^{3/4}\,a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(5\sqrt{2}\;b^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(3\times 3^{1/4}\,a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 353 leaves) :

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

$$\left(5\,(-1)^{2/3}\,b^{1/3}\,\left(b^{1/3}+a^{1/3}\,x\right)^2\,\sqrt{\frac{\left(1+(-1)^{1/3}\right)\,a^{1/3}\,x\,\left(b^{1/3}-(-1)^{1/3}\,a^{1/3}\,x\right)}{\left(b^{1/3}+a^{1/3}\,x\right)^2}}\right.$$

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

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

Problem 2051: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 520 leaves, 5 steps):

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

$$\left.\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\mathtt{EllipticE}\left[\mathtt{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4\sqrt{3}\right]\right)\Bigg/$$

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

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

$$\left(3\times 3^{1/4}\,a^{2/3}\,b^{2/3}\sqrt{a+\frac{b}{x^3}}\;\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 352 leaves):

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

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

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}\;\left(\left(-3-\mathrm{i}\sqrt{3}\right)\mathtt{EllipticE}\left[\mathtt{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left.\left(1+\mathrm{i}\sqrt{3}\right)\mathtt{EllipticF}\left[\mathtt{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i}\sqrt{3}\right)a^{1/3}\,x}{b^{1/3}+a^{1/3}\,x}}}{\sqrt{2}}\right],\frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)\Bigg/\left(2\left(-1+(-1)^{2/3}\right)a\right)\right)$$

Problem 2052: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^6}\,dx$$

Optimal (type 4, 517 leaves, 5 steps):

$$-\frac{8\sqrt{a+\frac{b}{x^3}}}{3\,b^{5/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{2}{3\,b\sqrt{a+\frac{b}{x^3}}\;x^2}+$$

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

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

$$\left(3^{3/4}\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(8\sqrt{2}\;a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(3\times 3^{1/4}\,b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 362 leaves):

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

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

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

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

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

Problem 2053: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2}\,x^9}\,dx$$

Optimal (type 4, 541 leaves, 6 steps):

$$\frac{80\,a\,\sqrt{a+\frac{b}{x^3}}}{21\,b^{8/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{2}{3\,b\,\sqrt{a+\frac{b}{x^3}}\;x^5}-$$

$$\frac{20\,\sqrt{a+\frac{b}{x^3}}}{21\,b^2\,x^2}-\left(40\,\sqrt{2-\sqrt{3}}\;a^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}\,b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right.$$

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

$$\left(7\times 3^{3/4}\,b^{8/3}\,\sqrt{a+\frac{b}{x^3}}\,\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)+\left(80\,\sqrt{2}\;a^{4/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(21\times 3^{1/4}\,b^{8/3}\,\sqrt{a+\frac{b}{x^3}}\,\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 380 leaves) :

$$\left(2\left(b+a x^3\right)\left(7 a^2 x^3-40 a^{4/3} x\left(b^{2/3}-a^{1/3} b^{1/3} x+a^{2/3} x^2\right)+33 a\left(b+a x^3\right)-\frac{3 b\left(b+a x^3\right)}{x^3}-\right.\right.$$

$$\frac{1}{-1+(-1)^{2/3}} 20(-1)^{2/3} a\, b^{1/3}\left(b^{1/3}+a^{1/3} x\right)^2 \sqrt{\frac{\left(1+(-1)^{1/3}\right) a^{1/3} x\left(b^{1/3}-(-1)^{1/3} a^{1/3} x\right)}{\left(b^{1/3}+a^{1/3} x\right)^2}}$$

$$\sqrt{\frac{b^{1/3}+(-1)^{2/3} a^{1/3} x}{b^{1/3}+a^{1/3} x}}\left(\left(-3-\mathrm{i} \sqrt{3}\right) \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i} \sqrt{3}\right) a^{1/3} x}{b^{1/3}+a^{1/3} x}}}{\sqrt{2}}\right], \frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]+\right.$$

$$\left.\left.\left.\left(1+\mathrm{i} \sqrt{3}\right) \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+\mathrm{i} \sqrt{3}\right) a^{1/3} x}{b^{1/3}+a^{1/3} x}}}{\sqrt{2}}\right], \frac{-\mathrm{i}+\sqrt{3}}{\mathrm{i}+\sqrt{3}}\right]\right)\right)\right) \Big/ \left(21 b^3\left(a+\frac{b}{x^3}\right)^{3/2} x^5\right)$$

Problem 2054: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^{12}}\, dx$$

Optimal (type 4, 565 leaves, 7 steps):

$$-\frac{1280\,a^2\sqrt{a+\frac{b}{x^3}}}{273\,b^{11/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)}+\frac{2}{3\,b\sqrt{a+\frac{b}{x^3}}\,x^8}-$$

$$\frac{32\sqrt{a+\frac{b}{x^3}}}{39\,b^2\,x^5}+\frac{320\,a\sqrt{a+\frac{b}{x^3}}}{273\,b^3\,x^2}+\left(640\sqrt{2-\sqrt{3}}\,a^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

$$\left.\sqrt{\frac{a^{2/3}+\frac{b^{2/3}}{x^2}-\frac{a^{1/3}b^{1/3}}{x}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\;\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}}\right],-7-4\sqrt{3}\right]\right)\Bigg/$$

$$\left(91\times 3^{3/4}\,b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)-\left(1280\sqrt{2}\,a^{7/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)\right.$$

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

$$\left(273\times 3^{1/4}\,b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}}{x}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}}{x}\right)^2}}\right)$$

Result (type 4, 400 leaves) :

$$\left(2\left(b+a x^3\right)\left(-91 a^3 x^3+640 a^{7/3} x\left(b^{2/3}-a^{1/3} b^{1/3} x+a^{2/3} x^2\right)-\right.\right.$$

$$549 a^2\left(b+a x^3\right)-\frac{21 b^2\left(b+a x^3\right)}{x^6}+\frac{69 a b\left(b+a x^3\right)}{x^3}+\frac{1}{-1+(-1)^{2/3}}$$

$$320(-1)^{2/3} a^2 b^{1/3}\left(b^{1/3}+a^{1/3} x\right)^2 \sqrt{\frac{\left(1+(-1)^{1/3}\right) a^{1/3} x\left(b^{1/3}-(-1)^{1/3} a^{1/3} x\right)}{\left(b^{1/3}+a^{1/3} x\right)^2}}$$

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

$$\left.\left.\left.\left(1+i \sqrt{3}\right) \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(3+i \sqrt{3}\right) a^{1/3} x}{b^{1/3}+a^{1/3} x}}}{\sqrt{2}}\right], \frac{-i+\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\right) \Big/ \left(273 b^4\left(a+\frac{b}{x^3}\right)^{3/2} x^5\right)$$

Problem 2060: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{a+\frac{b}{x^4}}\, x^2 \, dx$$

Optimal (type 4, 107 leaves, 3 steps):

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

Result (type 4, 93 leaves):

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

Problem 2061: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{a+\frac{b}{x^4}}\,dx$$

Optimal (type 4, 224 leaves, 5 steps):

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

Result (type 4, 119 leaves):

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

Problem 2062: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^2}\,dx$$

Optimal (type 4, 107 leaves, 3 steps):

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

Result (type 4, 96 leaves):

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

Problem 2063: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+\frac{b}{x^4}}}{x^4}\,dx$$

Optimal (type 4, 236 leaves, 5 steps):

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

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

Result (type 4, 138 leaves):

$$\frac{1}{5}\sqrt{a+\frac{b}{x^4}}\,x^2\left(-\frac{b+2\,a\,x^4}{b\,x^5}-\frac{1}{b+a\,x^4}2\,\mathrm{i}\,a\sqrt{\frac{\mathrm{i}\sqrt{a}}{\sqrt{b}}}\sqrt{1+\frac{a\,x^4}{b}}\right.$$
$$\left.\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]\right)\right)$$

Problem 2068: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 126 leaves, 4 steps):

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

Result (type 4, 128 leaves):

$$\left(\sqrt{a+\frac{b}{x^4}} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(-b^2+a^2 x^8\right)-4 i a b x^3 \sqrt{1+\frac{a x^4}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} x\right], -1\right]\right)\right) \Big/ \left(3 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} x \left(b+a x^4\right)\right)$$

Problem 2069: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 250 leaves, 6 steps):

$$-\frac{6 b \sqrt{a+\frac{b}{x^4}}}{5 x^3}-\frac{12 a \sqrt{b} \sqrt{a+\frac{b}{x^4}}}{5 \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) x}+\left(a+\frac{b}{x^4}\right)^{3/2} x+$$

$$\frac{12 a^{5/4} b^{1/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticE}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right], \frac{1}{2}\right]}{5 \sqrt{a+\frac{b}{x^4}}}-$$

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

Result (type 4, 196 leaves):

$$-\left(\left(\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(b^2+8\,a\,b\,x^4+7\,a^2\,x^8\right)-12\,a^{3/2}\sqrt{b}\,x^5\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]+12\,a^{3/2}\sqrt{b}\,x^5\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]\right)\right)\Big/\left(5\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,x^3\left(b+a\,x^4\right)\right)\right)$$

Problem 2070: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 126 leaves, 4 steps):

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

Result (type 4, 135 leaves):

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

Problem 2071: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 257 leaves, 6 steps):

$$-\frac{2 a \sqrt{a+\frac{b}{x^4}}}{15 x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{9 x^3}-\frac{4 a^2 \sqrt{a+\frac{b}{x^4}}}{15 \sqrt{b} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) x}+$$

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

$$\frac{2 a^{9/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{15 b^{3/4} \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 213 leaves) :

$$\frac{\left(a+\frac{b}{x^4}\right)^{3/2} \left(-\frac{b}{9 x^9}-\frac{11 a}{45 x^5}-\frac{4 a^2}{15 b x}\right) x^6}{b+a x^4}+$$

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

$$\left.\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} x\right],-1\right]\right)\right) \Big/ \left(15 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \sqrt{b} \left(b+a x^4\right)^2\right)$$

Problem 2076: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a+\frac{b}{x^4}\right)^{5/2} x^2 \, dx$$

Optimal (type 4, 146 leaves, 5 steps) :

$$-\frac{20 a b \sqrt{a+\frac{b}{x^4}}}{21 x}-\frac{10 b \left(a+\frac{b}{x^4}\right)^{3/2}}{21 x}+\frac{1}{3} \left(a+\frac{b}{x^4}\right)^{5/2} x^3-$$

$$\frac{20 a^{7/4} b^{3/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{21 \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 149 leaves):

$$\left(\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(-3 b^3-19 a b^2 x^4-9 a^2 b x^8+7 a^3 x^{12}\right)-40 i a^2 b x^7 \sqrt{1+\frac{a x^4}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}} x\right],-1\right]\right)\right)\Big/\left(21 \sqrt{\frac{i\sqrt{a}}{\sqrt{b}}} x^5\left(b+a x^4\right)\right)$$

Problem 2077: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(a+\frac{b}{x^4}\right)^{5/2} dx$$

Optimal (type 4, 272 leaves, 7 steps):

$$-\frac{4 a b \sqrt{a+\frac{b}{x^4}}}{3 x^3}-\frac{10 b\left(a+\frac{b}{x^4}\right)^{3/2}}{9 x^3}-\frac{8 a^2 \sqrt{b} \sqrt{a+\frac{b}{x^4}}}{3\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) x}+\left(a+\frac{b}{x^4}\right)^{5/2} x+\frac{8 a^{9/4} b^{1/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticE}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{3 \sqrt{a+\frac{b}{x^4}}}-\frac{4 a^{9/4} b^{1/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{3 \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 207 leaves):

$$-\left(\left(\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(b^3+5 a b^2 x^4+19 a^2 b x^8+15 a^3 x^{12}\right)-24 a^{5/2} \sqrt{b} x^9 \sqrt{1+\frac{a x^4}{b}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}} x\right],-1\right]+24 a^{5/2} \sqrt{b} x^9 \sqrt{1+\frac{a x^4}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}} x\right],-1\right]\right)\right)\Big/\left(9 \sqrt{\frac{i\sqrt{a}}{\sqrt{b}}} x^7\left(b+a x^4\right)\right)\right)$$

Problem 2078: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x^2} \, dx$$

Optimal (type 4, 147 leaves, 5 steps):

$$-\frac{20 a^2 \sqrt{a+\frac{b}{x^4}}}{77 x}-\frac{10 a \left(a+\frac{b}{x^4}\right)^{3/2}}{77 x}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{11 x}-\frac{20 a^{11/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{77 b^{1/4} \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 148 leaves):

$$-\left(\left(\sqrt{a+\frac{b}{x^4}} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(7 b^3+31 a b^2 x^4+61 a^2 b x^8+37 a^3 x^{12}\right)+40 i a^3 x^{11} \sqrt{1+\frac{a x^4}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} x\right],-1\right]\right)\right) \Bigg/ \left(77 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} x^9 \left(b+a x^4\right)\right)\right)$$

Problem 2079: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x^4} \, dx$$

Optimal (type 4, 278 leaves, 7 steps):

$$-\frac{4 a^2 \sqrt{a+\frac{b}{x^4}}}{39 x^3}-\frac{10 a \left(a+\frac{b}{x^4}\right)^{3/2}}{117 x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{13 x^3}-\frac{8 a^3 \sqrt{a+\frac{b}{x^4}}}{39 \sqrt{b} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) x}+$$

$$\frac{8 a^{13/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticE}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right], \frac{1}{2}\right]}{39 b^{3/4} \sqrt{a+\frac{b}{x^4}}}-$$

$$\frac{4 a^{13/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right], \frac{1}{2}\right]}{39 b^{3/4} \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 223 leaves) :

$$-\left(\left(\sqrt{a+\frac{b}{x^4}} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(9 b^4+37 a b^3 x^4+59 a^2 b^2 x^8+55 a^3 b x^{12}+24 a^4 x^{16}\right)-\right.\right.\right.$$

$$24 a^{7/2} \sqrt{b}\, x^{13} \sqrt{1+\frac{a x^4}{b}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, x\right], -1\right]+24 a^{7/2} \sqrt{b}\, x^{13}$$

$$\left.\left.\left.\sqrt{1+\frac{a x^4}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, x\right], -1\right]\right)\right) \Big/ \left(117 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, b x^{11} \left(b+a x^4\right)\right)\right)$$

Problem 2082: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 27 leaves, 3 steps) :

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right]}{2 \sqrt{a}}$$

Result (type 3, 55 leaves) :

$$\frac{\sqrt{b+a\,x^4}\ \text{ArcTanh}\left[\frac{\sqrt{a}\ x^2}{\sqrt{b+a\,x^4}}\right]}{2\,\sqrt{a}\ \sqrt{a+\frac{b}{x^4}}\ x^2}$$

Problem 2084: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Optimal (type 4, 110 leaves, 3 steps):

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

Result (type 4, 113 leaves):

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

Problem 2085: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 231 leaves, 5 steps):

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

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

Result (type 4, 107 leaves):

$$\left(i\sqrt{1+\frac{a\,x^4}{b}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\;x\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\;x\right],-1\right]\right)\right)\Big/\left(\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}\sqrt{a+\frac{b}{x^4}}\;x^2\right)$$

Problem 2086: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^4}}\;x^2}\,dx$$

Optimal (type 4, 88 leaves, 2 steps):

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

Result (type 4, 77 leaves):

$$-\frac{i\sqrt{1+\frac{a\,x^4}{b}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\;x\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}\;x^2}$$

Problem 2087: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 212 leaves, 4 steps):

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

Result (type 4, 173 leaves):

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

Problem 2092: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 131 leaves, 4 steps):

$$-\frac{x^3}{2\,a\,\sqrt{a+\frac{b}{x^4}}}+\frac{5\,\sqrt{a+\frac{b}{x^4}}\,x^3}{6\,a^2}+\frac{5\,b^{3/4}\,\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\,\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcCot}\left[\frac{a^{1/4}\,x}{b^{1/4}}\right],\,\frac{1}{2}\right]}{12\,a^{9/4}\,\sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 116 leaves):

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

Problem 2093: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 258 leaves, 6 steps):

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

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

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

Result (type 4, 166 leaves):

$$\left(-\sqrt{a}\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x^3+3\,\sqrt{b}\,\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]-3\,\sqrt{b}\,\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]\right)\Bigg/\left(2\,a^{3/2}\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,\sqrt{a+\frac{b}{x^4}}\,x^2\right)$$

Problem 2094: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 110 leaves, 3 steps):

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

Result (type 4, 105 leaves):

$$-\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x+\mathrm{i}\,\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]}{2\,a\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,\sqrt{a+\frac{b}{x^4}}\,x^2}$$

Problem 2095: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 241 leaves, 5 steps):

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

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

Result (type 4, 166 leaves) :

$$\left(i\left(\sqrt{a}\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,x^3-\sqrt{b}\,\sqrt{1+\frac{a\,x^4}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]+\right.\right.$$

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

Problem 2100: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2}{\left(a+\frac{b}{x^4}\right)^{5/2}}\,dx$$

Optimal (type 4, 152 leaves, 5 steps) :

$$-\frac{x^3}{6\,a\,\left(a+\frac{b}{x^4}\right)^{3/2}}-\frac{3\,x^3}{4\,a^2\,\sqrt{a+\frac{b}{x^4}}}+\frac{5\,\sqrt{a+\frac{b}{x^4}}\,x^3}{4\,a^3}+$$

$$\frac{5\,b^{3/4}\,\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\,\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcCot}\left[\frac{a^{1/4}\,x}{b^{1/4}}\right],\frac{1}{2}\right]}{8\,a^{13/4}\,\sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 118 leaves) :

$$\frac{\frac{15 b^2 x+21 a b x^5+4 a^2 x^9}{b+a x^4}+\frac{15 \mathrm{i} b \sqrt{1+\frac{a x^4}{b}} \operatorname{EllipticF}\left[\mathrm{i} \operatorname{ArcSinh}\left[\sqrt{\frac{\mathrm{i} \sqrt{a}}{\sqrt{b}}} x\right],-1\right]}{\sqrt{\frac{\mathrm{i} \sqrt{a}}{\sqrt{b}}}}}{12 a^3 \sqrt{a+\frac{b}{x^4}} x^2}$$

Problem 2101: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2}} \, dx$$

Optimal (type 4, 277 leaves, 7 steps):

$$-\frac{7 \sqrt{b} \sqrt{a+\frac{b}{x^4}}}{4 a^3 \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) x}-\frac{x}{6 a \left(a+\frac{b}{x^4}\right)^{3/2}}-\frac{7 x}{12 a^2 \sqrt{a+\frac{b}{x^4}}}+\frac{7 \sqrt{a+\frac{b}{x^4}} x}{4 a^3}+$$

$$\frac{7 b^{1/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \operatorname{EllipticE}\left[2 \operatorname{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{4 a^{11/4} \sqrt{a+\frac{b}{x^4}}}-$$

$$\frac{7 b^{1/4} \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \operatorname{EllipticF}\left[2 \operatorname{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right],\frac{1}{2}\right]}{8 a^{11/4} \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 153 leaves):

$$\frac{1}{4 \left(a+\frac{b}{x^4}\right)^{5/2} x^{10}} \left(b+a x^4\right)^2 \left(-\frac{x^3 \left(7 b+9 a x^4\right)}{3 a^2 \left(b+a x^4\right)}+\frac{1}{a^2 \left(\frac{\mathrm{i} \sqrt{a}}{\sqrt{b}}\right)^{3/2}} 7 \mathrm{i} \sqrt{1+\frac{a x^4}{b}}\right.$$

$$\left.\left(\operatorname{EllipticE}\left[\mathrm{i} \operatorname{ArcSinh}\left[\sqrt{\frac{\mathrm{i} \sqrt{a}}{\sqrt{b}}} x\right],-1\right]-\operatorname{EllipticF}\left[\mathrm{i} \operatorname{ArcSinh}\left[\sqrt{\frac{\mathrm{i} \sqrt{a}}{\sqrt{b}}} x\right],-1\right]\right)\right)$$

Problem 2102: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x^2} \, dx$$

Optimal (type 4, 131 leaves, 4 steps):

$$-\frac{1}{6 a \left(a+\frac{b}{x^4}\right)^{3/2} x}-\frac{5}{12 a^2 \sqrt{a+\frac{b}{x^4}}\, x}-\frac{5 \sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}} \left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right) \text{EllipticF}\left[2 \text{ArcCot}\left[\frac{a^{1/4} x}{b^{1/4}}\right], \frac{1}{2}\right]}{24 a^{9/4} b^{1/4} \sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 107 leaves):

$$\frac{-\frac{5 b x+7 a x^5}{b+a x^4}-\frac{5 i \sqrt{1+\frac{a x^4}{b}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, x\right],-1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}}{12 a^2 \sqrt{a+\frac{b}{x^4}}\, x^2}$$

Problem 2103: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x^4} \, dx$$

Optimal (type 4, 262 leaves, 6 steps):

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

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

$$\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcCot}\left[\frac{a^{1/4}\,x}{b^{1/4}}\right],\frac{1}{2}\right]}{8\,a^{7/4}\,b^{3/4}\sqrt{a+\frac{b}{x^4}}}$$

Result (type 4, 155 leaves):

$$\frac{1}{4\left(a+\frac{b}{x^4}\right)^{5/2}x^{10}}\left(b+a\,x^4\right)^2\left(\frac{b\,x^3+3\,a\,x^7}{3\,a\,b^2+3\,a^2\,b\,x^4}+\frac{1}{a^2}\,\mathrm{i}\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,\sqrt{1+\frac{a\,x^4}{b}}\right.$$
$$\left.\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,x\right],-1\right]\right)\right)$$

Problem 2105: Unable to integrate problem.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^5}}\;x}\,dx$$

Optimal (type 3, 27 leaves, 3 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{a+\frac{b}{x^5}}}{\sqrt{a}}\right]}{5\,\sqrt{a}}$$

Result (type 8, 17 leaves):

$$\int\frac{1}{\sqrt{a+\frac{b}{x^5}}\;x}\,dx$$

Problem 2106: Unable to integrate problem.

$$\int \frac{1}{\sqrt{-a+\frac{b}{x^5}}\ x} \, dx$$

Optimal (type 3, 29 leaves, 3 steps):

$$-\frac{2\,\text{ArcTan}\left[\frac{\sqrt{-a+\frac{b}{x^5}}}{\sqrt{a}}\right]}{5\sqrt{a}}$$

Result (type 8, 19 leaves):

$$\int \frac{1}{\sqrt{-a+\frac{b}{x^5}}\ x} \, dx$$

Problem 2147: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\sqrt{x}\right)^5}{x^4} \, dx$$

Optimal (type 2, 21 leaves, 1 step):

$$-\frac{\left(a+b\sqrt{x}\right)^6}{3\,a\,x^3}$$

Result (type 2, 63 leaves):

$$-\frac{a^5+6\,a^4\,b\,\sqrt{x}+15\,a^3\,b^2\,x+20\,a^2\,b^3\,x^{3/2}+15\,a\,b^4\,x^2+6\,b^5\,x^{5/2}}{3\,x^3}$$

Problem 2155: Result more than twice size of optimal antiderivative.

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

Optimal (type 2, 38 leaves, 3 steps):

$$-\frac{2\,a\left(a+b\sqrt{x}\right)^{11}}{11\,b^2}+\frac{\left(a+b\sqrt{x}\right)^{12}}{6\,b^2}$$

Result (type 2, 131 leaves):

$$a^{10}\,x+\frac{20}{3}\,a^9\,b\,x^{3/2}+\frac{45}{2}\,a^8\,b^2\,x^2+48\,a^7\,b^3\,x^{5/2}+70\,a^6\,b^4\,x^3+$$
$$72\,a^5\,b^5\,x^{7/2}+\frac{105}{2}\,a^4\,b^6\,x^4+\frac{80}{3}\,a^3\,b^7\,x^{9/2}+9\,a^2\,b^8\,x^5+\frac{20}{11}\,a\,b^9\,x^{11/2}+\frac{b^{10}\,x^6}{6}$$

Problem 2162: Result more than twice size of optimal antiderivative.

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

Optimal (type 2, 46 leaves, 3 steps):

$$-\frac{\left(a+b\sqrt{x}\right)^{11}}{6\,a\,x^6}+\frac{b\left(a+b\sqrt{x}\right)^{11}}{66\,a^2\,x^{11/2}}$$

Result (type 2, 124 leaves):

$$-\frac{1}{66\,x^6}\left(11\,a^{10}+120\,a^9\,b\,\sqrt{x}+594\,a^8\,b^2\,x+1760\,a^7\,b^3\,x^{3/2}+3465\,a^6\,b^4\,x^2+4752\,a^5\,b^5\,x^{5/2}+4620\,a^4\,b^6\,x^3+3168\,a^3\,b^7\,x^{7/2}+1485\,a^2\,b^8\,x^4+440\,a\,b^9\,x^{9/2}+66\,b^{10}\,x^5\right)$$

Problem 2171: Result more than twice size of optimal antiderivative.

$$\int \left(a+b\sqrt{x}\right)^{15} x\,dx$$

Optimal (type 2, 80 leaves, 3 steps):

$$-\frac{a^3\left(a+b\sqrt{x}\right)^{16}}{8\,b^4}+\frac{6\,a^2\left(a+b\sqrt{x}\right)^{17}}{17\,b^4}-\frac{a\left(a+b\sqrt{x}\right)^{18}}{3\,b^4}+\frac{2\left(a+b\sqrt{x}\right)^{19}}{19\,b^4}$$

Result (type 2, 199 leaves):

$$\frac{a^{15}\,x^2}{2}+6\,a^{14}\,b\,x^{5/2}+35\,a^{13}\,b^2\,x^3+130\,a^{12}\,b^3\,x^{7/2}+\frac{1365}{4}\,a^{11}\,b^4\,x^4+\frac{2002}{3}\,a^{10}\,b^5\,x^{9/2}+1001\,a^9\,b^6\,x^5+1170\,a^8\,b^7\,x^{11/2}+\frac{2145}{2}\,a^7\,b^8\,x^6+770\,a^6\,b^9\,x^{13/2}+429\,a^5\,b^{10}\,x^7+182\,a^4\,b^{11}\,x^{15/2}+\frac{455}{8}\,a^3\,b^{12}\,x^8+\frac{210}{17}\,a^2\,b^{13}\,x^{17/2}+\frac{5}{3}\,a\,b^{14}\,x^9+\frac{2}{19}\,b^{15}\,x^{19/2}$$

Problem 2172: Result more than twice size of optimal antiderivative.

$$\int \left(a+b\sqrt{x}\right)^{15}\,dx$$

Optimal (type 2, 38 leaves, 3 steps):

$$-\frac{a\left(a+b\sqrt{x}\right)^{16}}{8\,b^2}+\frac{2\left(a+b\sqrt{x}\right)^{17}}{17\,b^2}$$

Result (type 2, 190 leaves):

$$a^{15}\,x+10\,a^{14}\,b\,x^{3/2}+\frac{105}{2}\,a^{13}\,b^2\,x^2+182\,a^{12}\,b^3\,x^{5/2}+455\,a^{11}\,b^4\,x^3+ 858\,a^{10}\,b^5\,x^{7/2}+\frac{5005}{4}\,a^9\,b^6\,x^4+1430\,a^8\,b^7\,x^{9/2}+1287\,a^7\,b^8\,x^5+910\,a^6\,b^9\,x^{11/2}+ \frac{1001}{2}\,a^5\,b^{10}\,x^6+210\,a^4\,b^{11}\,x^{13/2}+65\,a^3\,b^{12}\,x^7+14\,a^2\,b^{13}\,x^{15/2}+\frac{15}{8}\,a\,b^{14}\,x^8+\frac{2}{17}\,b^{15}\,x^{17/2}$$

Problem 2180: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,\sqrt{x}\right)^{15}}{x^9}\,dx$$

Optimal (type 2, 21 leaves, 1 step):

$$-\frac{\left(a+b\,\sqrt{x}\right)^{16}}{8\,a\,x^8}$$

Result (type 2, 183 leaves):

$$-\frac{1}{8\,x^8}\left(a^{15}+16\,a^{14}\,b\,\sqrt{x}+120\,a^{13}\,b^2\,x+560\,a^{12}\,b^3\,x^{3/2}+1820\,a^{11}\,b^4\,x^2+4368\,a^{10}\,b^5\,x^{5/2}+ 8008\,a^9\,b^6\,x^3+11\,440\,a^8\,b^7\,x^{7/2}+12\,870\,a^7\,b^8\,x^4+11\,440\,a^6\,b^9\,x^{9/2}+8008\,a^5\,b^{10}\,x^5+ 4368\,a^4\,b^{11}\,x^{11/2}+1820\,a^3\,b^{12}\,x^6+560\,a^2\,b^{13}\,x^{13/2}+120\,a\,b^{14}\,x^7+16\,b^{15}\,x^{15/2}\right)$$

Problem 2181: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,\sqrt{x}\right)^{15}}{x^{10}}\,dx$$

Optimal (type 2, 70 leaves, 4 steps):

$$-\frac{\left(a+b\,\sqrt{x}\right)^{16}}{9\,a\,x^9}+\frac{2\,b\,\left(a+b\,\sqrt{x}\right)^{16}}{153\,a^2\,x^{17/2}}-\frac{b^2\,\left(a+b\,\sqrt{x}\right)^{16}}{1224\,a^3\,x^8}$$

Result (type 2, 185 leaves):

$$-\frac{1}{1224\,x^9}\left(136\,a^{15}+2160\,a^{14}\,b\,\sqrt{x}+16\,065\,a^{13}\,b^2\,x+74\,256\,a^{12}\,b^3\,x^{3/2}+238\,680\,a^{11}\,b^4\,x^2+565\,488\,a^{10}\,b^5\,x^{5/2}+ 1\,021\,020\,a^9\,b^6\,x^3+1\,432\,080\,a^8\,b^7\,x^{7/2}+1\,575\,288\,a^7\,b^8\,x^4+1\,361\,360\,a^6\,b^9\,x^{9/2}+918\,918\,a^5\,b^{10}\,x^5+ 477\,360\,a^4\,b^{11}\,x^{11/2}+185\,640\,a^3\,b^{12}\,x^6+51\,408\,a^2\,b^{13}\,x^{13/2}+9180\,a\,b^{14}\,x^7+816\,b^{15}\,x^{15/2}\right)$$

Problem 2216: Result more than twice size of optimal antiderivative.

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

Optimal (type 2, 21 leaves, 1 step):

$$\frac{x^2}{2\,a\,\left(a+b\,\sqrt{x}\right)^4}$$

Result (type 2, 50 leaves):

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

Problem 2268: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 42 leaves, 3 steps):

$$\frac{x^5\,\left(a+b\,x^{3/2}\right)^{1/3}\,\text{Hypergeometric2F1}\left[1,\,\frac{11}{3},\,\frac{13}{3},\,-\frac{b\,x^{3/2}}{a}\right]}{5\,a}$$

Result (type 5, 103 leaves):

$$\left(\sqrt{x}\,\left(14\,a^3+7\,a^2\,b\,x^{3/2}-2\,a\,b^2\,x^3+5\,b^3\,x^{9/2}-14\,a^3\,\left(1+\frac{b\,x^{3/2}}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{2}{3},\,\frac{4}{3},\,-\frac{b\,x^{3/2}}{a}\right]\right)\right)\Big/\left(20\,b^3\,\left(a+b\,x^{3/2}\right)^{2/3}\right)$$

Problem 2269: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 198 leaves, 10 steps):

$$-\frac{5\,a\,x\,\left(a+b\,x^{3/2}\right)^{1/3}}{9\,b^2}+\frac{x^{5/2}\,\left(a+b\,x^{3/2}\right)^{1/3}}{3\,b}-\frac{10\,a^2\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,\sqrt{x}}{\left(a+b\,x^{3/2}\right)^{1/3}}}{\sqrt{3}}\right]}{9\,\sqrt{3}\,b^{8/3}}-\frac{10\,a^2\,\text{Log}\left[1-\frac{b^{1/3}\,\sqrt{x}}{\left(a+b\,x^{3/2}\right)^{1/3}}\right]}{27\,b^{8/3}}+\frac{5\,a^2\,\text{Log}\left[1+\frac{b^{2/3}\,x}{\left(a+b\,x^{3/2}\right)^{2/3}}+\frac{b^{1/3}\,\sqrt{x}}{\left(a+b\,x^{3/2}\right)^{1/3}}\right]}{27\,b^{8/3}}$$

Result (type 5, 87 leaves):

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

Problem 2272: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 140 leaves, 8 steps):

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

Result (type 5, 53 leaves):

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

Problem 2273: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 85 leaves, 5 steps):

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

Result (type 5, 52 leaves):

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

Problem 2276: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 148 leaves, 7 steps):

$$-\frac{\left(a+b x^{3/2}\right)^{1/3}}{3 a x^3}+\frac{5 b \left(a+b x^{3/2}\right)^{1/3}}{9 a^2 x^{3/2}}-$$
$$\frac{10 b^2 \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^{3/2}\right)^{1/3}}{\sqrt{3}\ a^{1/3}}\right]}{9 \sqrt{3}\ a^{8/3}}-\frac{5 b^2 \operatorname{Log}[x]}{18 a^{8/3}}+\frac{5 b^2 \operatorname{Log}\left[a^{1/3}-\left(a+b x^{3/2}\right)^{1/3}\right]}{9 a^{8/3}}$$

Result (type 5, 91 leaves):

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

Problem 2312: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^{1/3}\right)^5}{x^3}\,dx$$

Optimal (type 2, 21 leaves, 1 step):

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

Result (type 2, 65 leaves):

$$-\frac{a^5+6 a^4 b x^{1/3}+15 a^3 b^2 x^{2/3}+20 a^2 b^3 x+15 a b^4 x^{4/3}+6 b^5 x^{5/3}}{2 x^2}$$

Problem 2321: Result more than twice size of optimal antiderivative.

$$\int \left(a+b x^{1/3}\right)^{10}\,dx$$

Optimal (type 2, 59 leaves, 3 steps):

$$\frac{3 a^2 \left(a+b x^{1/3}\right)^{11}}{11 b^3}-\frac{a \left(a+b x^{1/3}\right)^{12}}{2 b^3}+\frac{3 \left(a+b x^{1/3}\right)^{13}}{13 b^3}$$

Result (type 2, 133 leaves):

$$a^{10} x+\frac{15}{2} a^9 b x^{4/3}+27 a^8 b^2 x^{5/3}+60 a^7 b^3 x^2+90 a^6 b^4 x^{7/3}+\frac{189}{2} a^5 b^5 x^{8/3}+70 a^4 b^6 x^3+36 a^3 b^7 x^{10/3}+\frac{135}{11} a^2 b^8 x^{11/3}+\frac{5}{2} a b^9 x^4+\frac{3}{13} b^{10} x^{13/3}$$

Problem 2326: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^{1/3}\right)^{10}}{x^5}\,dx$$

Optimal (type 2, 46 leaves, 3 steps):

$$-\frac{\left(a+b x^{1/3}\right)^{11}}{4 a x^4}+\frac{b \left(a+b x^{1/3}\right)^{11}}{44 a^2 x^{11/3}}$$

Result (type 2, 128 leaves):

$$-\frac{1}{44 x^4}\left(11 a^{10}+120 a^9 b x^{1/3}+594 a^8 b^2 x^{2/3}+1760 a^7 b^3 x+3465 a^6 b^4 x^{4/3}+4752 a^5 b^5 x^{5/3}+4620 a^4 b^6 x^2+3168 a^3 b^7 x^{7/3}+1485 a^2 b^8 x^{8/3}+440 a b^9 x^3+66 b^{10} x^{10/3}\right)$$

Problem 2337: Result more than twice size of optimal antiderivative.

$$\int \left(a+b\,x^{1/3}\right)^{15}\,dx$$

Optimal (type 2, 59 leaves, 3 steps):

$$\frac{3\,a^2\,\left(a+b\,x^{1/3}\right)^{16}}{16\,b^3}-\frac{6\,a\,\left(a+b\,x^{1/3}\right)^{17}}{17\,b^3}+\frac{\left(a+b\,x^{1/3}\right)^{18}}{6\,b^3}$$

Result (type 2, 204 leaves):

$$a^{15}\,x+\frac{45}{4}\,a^{14}\,b\,x^{4/3}+63\,a^{13}\,b^2\,x^{5/3}+\frac{455}{2}\,a^{12}\,b^3\,x^2+585\,a^{11}\,b^4\,x^{7/3}+\frac{9009}{8}\,a^{10}\,b^5\,x^{8/3}+\frac{5005}{3}\,a^9\,b^6\,x^3+\frac{3861}{2}\,a^8\,b^7\,x^{10/3}+1755\,a^7\,b^8\,x^{11/3}+\frac{5005}{4}\,a^6\,b^9\,x^4+693\,a^5\,b^{10}\,x^{13/3}+\frac{585}{2}\,a^4\,b^{11}\,x^{14/3}+91\,a^3\,b^{12}\,x^5+\frac{315}{16}\,a^2\,b^{13}\,x^{16/3}+\frac{45}{17}\,a\,b^{14}\,x^{17/3}+\frac{b^{15}\,x^6}{6}$$

Problem 2343: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,x^{1/3}\right)^{15}}{x^7}\,dx$$

Optimal (type 2, 72 leaves, 4 steps):

$$-\frac{\left(a+b\,x^{1/3}\right)^{16}}{6\,a\,x^6}+\frac{b\,\left(a+b\,x^{1/3}\right)^{16}}{51\,a^2\,x^{17/3}}-\frac{b^2\,\left(a+b\,x^{1/3}\right)^{16}}{816\,a^3\,x^{16/3}}$$

Result (type 2, 189 leaves):

$$-\frac{1}{816\,x^6}\left(136\,a^{15}+2160\,a^{14}\,b\,x^{1/3}+16\,065\,a^{13}\,b^2\,x^{2/3}+74\,256\,a^{12}\,b^3\,x+238\,680\,a^{11}\,b^4\,x^{4/3}+565\,488\,a^{10}\,b^5\,x^{5/3}+1\,021\,020\,a^9\,b^6\,x^2+1\,432\,080\,a^8\,b^7\,x^{7/3}+1\,575\,288\,a^7\,b^8\,x^{8/3}+1\,361\,360\,a^6\,b^9\,x^3+918\,918\,a^5\,b^{10}\,x^{10/3}+477\,360\,a^4\,b^{11}\,x^{11/3}+185\,640\,a^3\,b^{12}\,x^4+51\,408\,a^2\,b^{13}\,x^{13/3}+9180\,a\,b^{14}\,x^{14/3}+816\,b^{15}\,x^5\right)$$

Problem 2386: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 95 leaves, 4 steps):

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

Result (type 5, 53 leaves):

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

Problem 2471: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+b x^n\right)^2} \, dx$$

Optimal (type 5, 24 leaves, 1 step):

$$\frac{x \text{ Hypergeometric2F1}\left[2,\frac{1}{n},1+\frac{1}{n},-\frac{b x^n}{a}\right]}{a^2}$$

Result (type 5, 49 leaves):

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

Problem 2475: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 33 leaves, 1 step):

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

Result (type 5, 74 leaves):

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

Problem 2476: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 24 leaves, 1 step):

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

Result (type 5, 71 leaves):

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

Problem 2478: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 34 leaves, 1 step):

$$-\frac{\text{Hypergeometric2F1}\left[3,-\frac{1}{n},-\frac{1-n}{n},-\frac{b x^n}{a}\right]}{a^3 x}$$

Result (type 5, 76 leaves):

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

Problem 2479: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 36 leaves, 1 step):

$$-\frac{\text{Hypergeometric2F1}\left[3,-\frac{2}{n},-\frac{2-n}{n},-\frac{b x^n}{a}\right]}{2 a^3 x^2}$$

Result (type 5, 75 leaves):

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

Problem 2485: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 102 leaves):

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

Problem 2486: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 39 leaves, 2 steps):

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

Result (type 5, 94 leaves):

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

Problem 2488: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 100 leaves):

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

Problem 2490: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 144 leaves):

$$\left(x^2 \left(4 \left(a+b x^n\right) \left(a^2 \left(16+36 n+23 n^2\right)+a b \left(32+52 n+11 n^2\right) x^n+b^2 \left(16+16 n+3 n^2\right) x^{2 n}\right)+15 a^3 n^3 \sqrt{1+\frac{b x^n}{a}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{n},\frac{2+n}{n},-\frac{b x^n}{a}\right]\right)\right)\Big/\left(2 (4+n) (4+3 n) (4+5 n) \sqrt{a+b x^n}\right)$$

Problem 2491: Result more than twice size of optimal antiderivative.

$$\int \left(a+b x^n\right)^{5/2} dx$$

Optimal (type 5, 39 leaves, 2 steps):

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

Result (type 5, 135 leaves):

$$\left(x \left(2 \left(a+b x^n\right) \left(a^2 \left(4+18 n+23 n^2\right)+a b \left(8+26 n+11 n^2\right) x^n+b^2 \left(4+8 n+3 n^2\right) x^{2 n}\right)+15 a^3 n^3 \sqrt{1+\frac{b x^n}{a}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{n},1+\frac{1}{n},-\frac{b x^n}{a}\right]\right)\right)\Big/\left((2+n) (2+3 n) (2+5 n) \sqrt{a+b x^n}\right)$$

Problem 2493: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^n\right)^{5/2}}{x^2} dx$$

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

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

Result (type 5, 141 leaves):

$$\left(2\left(a+b x^n\right)\left(a^2\left(4-18 n+23 n^2\right)+a b\left(8-26 n+11 n^2\right) x^n+b^2\left(4-8 n+3 n^2\right) x^{2 n}\right)-15 a^3 n^3 \sqrt{1+\frac{b x^n}{a}}\ \text{Hypergeometric2F1}\left[\frac{1}{2},-\frac{1}{n},\frac{-1+n}{n},-\frac{b x^n}{a}\right]\right)\Big/\left((-2+n)(-2+3 n)(-2+5 n)\, x \sqrt{a+b x^n}\right)$$

Problem 2494: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^n\right)^{5/2}}{x^3}\, dx$$

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

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

Result (type 5, 144 leaves):

$$\left(4\left(a+b x^n\right)\left(a^2\left(16-36 n+23 n^2\right)+a b\left(32-52 n+11 n^2\right) x^n+b^2\left(16-16 n+3 n^2\right) x^{2 n}\right)-15 a^3 n^3 \sqrt{1+\frac{b x^n}{a}}\ \text{Hypergeometric2F1}\left[\frac{1}{2},-\frac{2}{n},\frac{-2+n}{n},-\frac{b x^n}{a}\right]\right)\Big/\left(2(-4+n)(-4+3 n)(-4+5 n)\, x^2 \sqrt{a+b x^n}\right)$$

Problem 2505: Result more than twice size of optimal antiderivative.

$$\int \frac{x}{\left(a+b x^n\right)^{5/2}}\, dx$$

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

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

Result (type 5, 100 leaves):

$$\left(x^2 \left(4\,a\,n + 4\,(-4+3\,n)\,(a+b\,x^n) + (16-16\,n+3\,n^2)\,(a+b\,x^n)\,\sqrt{1+\frac{b\,x^n}{a}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{n},\frac{2+n}{n},-\frac{b\,x^n}{a}\right]\right)\right)\Big/\left(6\,a^2\,n^2\,(a+b\,x^n)^{3/2}\right)$$

Problem 2506: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 39 leaves, 2 steps):

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

Result (type 5, 94 leaves):

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

Problem 2508: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 101 leaves):

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

Problem 2510: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 106 leaves, 6 steps):

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

Result (type 5, 68 leaves):

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

Problem 2554: Result more than twice size of optimal antiderivative.

$$\int x^{-1-6 n} (a+b x^n)^5 \, dx$$

Optimal (type 3, 24 leaves, 1 step):

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

Result (type 3, 72 leaves):

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

Problem 2566: Result more than twice size of optimal antiderivative.

$$\int x^{-1+2 n} (a+b x^n)^8 \, dx$$

Optimal (type 3, 40 leaves, 3 steps):

$$-\frac{a (a+b x^n)^9}{9 b^2 n} + \frac{(a+b x^n)^{10}}{10 b^2 n}$$

Result (type 3, 113 leaves):

$$\frac{1}{90 n} x^{2 n} \left(45 a^8+240 a^7 b x^n+630 a^6 b^2 x^{2 n}+1008 a^5 b^3 x^{3 n}+\right.$$
$$\left.1050 a^4 b^4 x^{4 n}+720 a^3 b^5 x^{5 n}+315 a^2 b^6 x^{6 n}+80 a b^7 x^{7 n}+9 b^8 x^{8 n}\right)$$

Problem 2577: Result more than twice size of optimal antiderivative.

$$\int x^{-1-9 n} (a+b x^n)^8 \, dx$$

Optimal (type 3, 24 leaves, 1 step):

$$-\frac{x^{-9 n} \left(a+b x^n\right)^9}{9 a n}$$

Result (type 3, 111 leaves):

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

Problem 2578: Result more than twice size of optimal antiderivative.

$$\int x^{-1-10 n} \left(a+b x^n\right)^8 \, dx$$

Optimal (type 3, 50 leaves, 3 steps):

$$-\frac{x^{-10 n} \left(a+b x^n\right)^9}{10 a n}+\frac{b x^{-9 n} \left(a+b x^n\right)^9}{90 a^2 n}$$

Result (type 3, 113 leaves):

$$-\frac{1}{90 n} x^{-10 n} \left(9 a^8+80 a^7 b x^n+315 a^6 b^2 x^{2 n}+720 a^5 b^3 x^{3 n}+1050 a^4 b^4 x^{4 n}+1008 a^3 b^5 x^{5 n}+630 a^2 b^6 x^{6 n}+240 a b^7 x^{7 n}+45 b^8 x^{8 n}\right)$$

Problem 2585: Result more than twice size of optimal antiderivative.

$$\int x^{12} \left(a+b x^{13}\right)^{12} \, dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^{13}\right)^{13}}{169 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{13}}{13}+\frac{6}{13} a^{11} b x^{26}+\frac{22}{13} a^{10} b^2 x^{39}+\frac{55}{13} a^9 b^3 x^{52}+\frac{99}{13} a^8 b^4 x^{65}+\frac{132}{13} a^7 b^5 x^{78}+\frac{132}{13} a^6 b^6 x^{91}+\frac{99}{13} a^5 b^7 x^{104}+\frac{55}{13} a^4 b^8 x^{117}+\frac{22}{13} a^3 b^9 x^{130}+\frac{6}{13} a^2 b^{10} x^{143}+\frac{1}{13} a b^{11} x^{156}+\frac{b^{12} x^{169}}{169}$$

Problem 2586: Result more than twice size of optimal antiderivative.

$$\int x^{24} \left(a+b x^{25}\right)^{12} \, dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^{25}\right)^{13}}{325 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{25}}{25}+\frac{6}{25} a^{11} b x^{50}+\frac{22}{25} a^{10} b^2 x^{75}+\frac{11}{5} a^9 b^3 x^{100}+\frac{99}{25} a^8 b^4 x^{125}+\frac{132}{25} a^7 b^5 x^{150}+\frac{132}{25} a^6 b^6 x^{175}+\frac{99}{25} a^5 b^7 x^{200}+\frac{11}{5} a^4 b^8 x^{225}+\frac{22}{25} a^3 b^9 x^{250}+\frac{6}{25} a^2 b^{10} x^{275}+\frac{1}{25} a b^{11} x^{300}+\frac{b^{12} x^{325}}{325}$$

Problem 2587: Result more than twice size of optimal antiderivative.

$$\int x^{36} \left(a+b x^{37}\right)^{12} dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 2633: Result is not expressed in closed-form.

$$\int \frac{x^{-1-\frac{2n}{3}}}{a+b x^n} dx$$

Optimal (type 3, 160 leaves, 8 steps):

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

Result (type 7, 60 leaves):

$$\frac{-9 a x^{-2n/3}+2 b \operatorname{RootSum}\left[b+a \sharp 1^3 \&, \frac{n \operatorname{Log}[x]+3 \operatorname{Log}\left[x^{-n/3}-\sharp 1\right]}{\sharp 1} \&\right]}{6 a^2 n}$$

Problem 2634: Result is not expressed in closed-form.

$$\int \frac{x^{-1-\frac{3n}{4}}}{a+b x^n} dx$$

Optimal (type 3, 236 leaves, 11 steps):

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

Result (type 7, 60 leaves):

$$\frac{-16\,a\,x^{-3\,n/4}+3\,b\,\text{RootSum}\left[b+a\,\#1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1}\,\&\right]}{12\,a^2\,n}$$

Problem 2637: Result is not expressed in closed-form.

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

Optimal (type 3, 158 leaves, 9 steps):

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

Result (type 7, 59 leaves):

$$\frac{-9\,a\,x^{-n/3}+b\,\text{RootSum}\left[b+a\,\#1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\#1\right]}{\#1^2}\,\&\right]}{3\,a^2\,n}$$

Problem 2638: Result is not expressed in closed-form.

$$\int \frac{x^{-1-\frac{n}{4}}}{a+b\,x^n}\,dx$$

Optimal (type 3, 234 leaves, 12 steps):

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

Result (type 7, 59 leaves):

$$\frac{-16\,a\,x^{-n/4}+b\,\text{RootSum}\left[b+a\,\#1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1^3}\,\&\right]}{4\,a^2\,n}$$

Problem 2640: Result is not expressed in closed-form.

$$\int \frac{x^{-1-\frac{4n}{3}}}{a+b\,x^n}\,dx$$

Optimal (type 3, 176 leaves, 10 steps):

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

Result (type 7, 70 leaves):

$$-\frac{1}{12\,a^3\,n}\left(9\,a\,x^{-4n/3}\,\left(a-4\,b\,x^n\right)+4\,b^2\,\text{RootSum}\left[b+a\,\sharp1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\sharp1\right]}{\sharp1^2}\,\&\right]\right)$$

Problem 2641: Result is not expressed in closed-form.

$$\int \frac{x^{-1-\frac{5n}{4}}}{a+b\,x^n}\,dx$$

Optimal (type 3, 252 leaves, 13 steps):

$$-\frac{4\,x^{-5n/4}}{5\,a\,n}+\frac{4\,b\,x^{-n/4}}{a^2\,n}+\frac{\sqrt{2}\,b^{5/4}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,a^{1/4}\,x^{-n/4}}{b^{1/4}}\right]}{a^{9/4}\,n}-\frac{\sqrt{2}\,b^{5/4}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,a^{1/4}\,x^{-n/4}}{b^{1/4}}\right]}{a^{9/4}\,n}+\frac{b^{5/4}\,\text{Log}\left[\sqrt{b}+\sqrt{a}\,x^{-n/2}-\sqrt{2}\,a^{1/4}\,b^{1/4}\,x^{-n/4}\right]}{\sqrt{2}\,a^{9/4}\,n}-\frac{b^{5/4}\,\text{Log}\left[\sqrt{b}+\sqrt{a}\,x^{-n/2}+\sqrt{2}\,a^{1/4}\,b^{1/4}\,x^{-n/4}\right]}{\sqrt{2}\,a^{9/4}\,n}$$

Result (type 7, 70 leaves):

$$-\frac{1}{20\,a^3\,n}\left(16\,a\,x^{-5n/4}\,\left(a-5\,b\,x^n\right)+5\,b^2\,\text{RootSum}\left[b+a\,\sharp1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\sharp1\right]}{\sharp1^3}\,\&\right]\right)$$

Problem 2665: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 40 leaves, 1 step):

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

Result (type 5, 100 leaves):

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

Problem 2666: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 55 leaves, 2 steps):

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

Result (type 5, 124 leaves):

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

Problem 2670: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 55 leaves, 2 steps):

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

Result (type 5, 129 leaves):

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

Problem 2693: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 97 leaves, 2 steps):

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

Result (type 5, 68 leaves):

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

Problem 2694: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 73 leaves):

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

Problem 2695: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 89 leaves, 2 steps):

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

Result (type 5, 57 leaves):

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

Problem 2696: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 114 leaves, 3 steps):

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

Result (type 5, 71 leaves):

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

Problem 2698: Result unnecessarily involves higher level functions.

$$\int\left(a+b\,x^n\right)^{-4-\frac{1}{n}}\,dx$$

Optimal (type 3, 146 leaves, 4 steps):

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

Result (type 5, 55 leaves):

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

Problem 2699: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 96 leaves, 3 steps):

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

Result (type 5, 55 leaves):

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

Problem 2700: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 50 leaves, 2 steps):

$$\frac{x \left(a+b x^n\right)^{-1-\frac{1}{n}}}{a (1+n)}+\frac{n x \left(a+b x^n\right)^{-1/n}}{a^2 (1+n)}$$

Result (type 5, 55 leaves):

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

Problem 2718: Result more than twice size of optimal antiderivative.

$$\int x^{-1-9 n} \left(a+b x^n\right)^8 \, dx$$

Optimal (type 3, 24 leaves, 1 step):

$$-\frac{x^{-9 n} \left(a+b x^n\right)^9}{9 a n}$$

Result (type 3, 111 leaves):

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

Problem 2720: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3\right)^8}{x^{28}} \, dx$$

Optimal (type 1, 19 leaves, 1 step):

$$-\frac{\left(a+b x^3\right)^9}{27 a x^{27}}$$

Result (type 1, 108 leaves):

$$-\frac{a^8}{27 x^{27}}-\frac{a^7 b}{3 x^{24}}-\frac{4 a^6 b^2}{3 x^{21}}-\frac{28 a^5 b^3}{9 x^{18}}-\frac{14 a^4 b^4}{3 x^{15}}-\frac{14 a^3 b^5}{3 x^{12}}-\frac{28 a^2 b^6}{9 x^9}-\frac{4 a b^7}{3 x^6}-\frac{b^8}{3 x^3}$$

Problem 2723: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 147 leaves, 4 steps):

$$\frac{x\left(a+b x^n\right)^{-3-\frac{1}{n}}}{a\left(1+3 n\right)}+\frac{3 n x\left(a+b x^n\right)^{-2-\frac{1}{n}}}{a^2\left(1+5 n+6 n^2\right)}+\frac{6 n^3 x\left(a+b x^n\right)^{-1/n}}{a^4\left(1+n\right)\left(1+2 n\right)\left(1+3 n\right)}+\frac{6 n^2 x\left(a+b x^n\right)^{-\frac{1+n}{n}}}{a^3\left(1+n\right)\left(1+2 n\right)\left(1+3 n\right)}$$

Result (type 5, 55 leaves):

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

Problem 2724: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 55 leaves):

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

Problem 2725: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 51 leaves, 2 steps):

$$\frac{n x\left(a+b x^n\right)^{-1/n}}{a^2\left(1+n\right)}+\frac{x\left(a+b x^n\right)^{-\frac{1+n}{n}}}{a\left(1+n\right)}$$

Result (type 5, 55 leaves):

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

Problem 2756: Result is not expressed in closed-form.

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

Optimal (type 3, 222 leaves, 9 steps):

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

Result (type 7, 72 leaves):

$$\frac{(c\,x)^{-2\,n/3}\left(-9\,a+2\,b\,x^{2\,n/3}\,\text{RootSum}\left[b+a\,\#1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\#1\right]}{\#1}\,\&\right]\right)}{6\,a^2\,c\,n}$$

Problem 2757: Result is not expressed in closed-form.

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

Optimal (type 3, 317 leaves, 12 steps):

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

Result (type 7, 72 leaves):

$$\frac{1}{12\,a^2\,c\,n}(c\,x)^{-3\,n/4}\left(-16\,a+3\,b\,x^{3\,n/4}\,\text{RootSum}\left[b+a\,\#1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1}\,\&\right]\right)$$

Problem 2760: Result is not expressed in closed-form.

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

Optimal (type 3, 220 leaves, 10 steps):

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

Result (type 7, 71 leaves):

$$\frac{(c\,x)^{-n/3}\left(-9\,a+b\,x^{n/3}\,\text{RootSum}\left[b+a\,\#1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\#1\right]}{\#1^2}\,\&\right]\right)}{3\,a^2\,c\,n}$$

Problem 2761: Result is not expressed in closed-form.

$$\int \frac{(c\,x)^{-1-\frac{n}{4}}}{a+b\,x^n}\,dx$$

Optimal (type 3, 315 leaves, 13 steps):

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

Result (type 7, 71 leaves):

$$\frac{(c\,x)^{-n/4}\left(-16\,a+b\,x^{n/4}\,\text{RootSum}\left[b+a\,\#1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1^3}\,\&\right]\right)}{4\,a^2\,c\,n}$$

Problem 2763: Result is not expressed in closed-form.

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

Optimal (type 3, 246 leaves, 11 steps):

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

Result (type 7, 82 leaves):

$$\frac{1}{12\,a^3\,c\,n}(c\,x)^{-4n/3}\left(-9\,a\,\left(a-4\,b\,x^n\right)-4\,b^2\,x^{4n/3}\,\text{RootSum}\left[b+a\,\#1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\#1\right]}{\#1^2}\,\&\right]\right)$$

Problem 2764: Result is not expressed in closed-form.

$$\int \frac{(c\,x)^{-1-\frac{5n}{4}}}{a+b\,x^n}\,dx$$

Optimal (type 3, 341 leaves, 14 steps):

$$-\frac{4\,(c\,x)^{-5n/4}}{5\,a\,c\,n}+\frac{4\,b\,x^n\,(c\,x)^{-5n/4}}{a^2\,c\,n}+\frac{\sqrt{2}\,b^{5/4}\,x^{5n/4}\,(c\,x)^{-5n/4}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,a^{1/4}\,x^{-n/4}}{b^{1/4}}\right]}{a^{9/4}\,c\,n}-\frac{\sqrt{2}\,b^{5/4}\,x^{5n/4}\,(c\,x)^{-5n/4}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,a^{1/4}\,x^{-n/4}}{b^{1/4}}\right]}{a^{9/4}\,c\,n}+\frac{b^{5/4}\,x^{5n/4}\,(c\,x)^{-5n/4}\,\text{Log}\left[\sqrt{b}+\sqrt{a}\,x^{-n/2}-\sqrt{2}\,a^{1/4}\,b^{1/4}\,x^{-n/4}\right]}{\sqrt{2}\,a^{9/4}\,c\,n}-\frac{b^{5/4}\,x^{5n/4}\,(c\,x)^{-5n/4}\,\text{Log}\left[\sqrt{b}+\sqrt{a}\,x^{-n/2}+\sqrt{2}\,a^{1/4}\,b^{1/4}\,x^{-n/4}\right]}{\sqrt{2}\,a^{9/4}\,c\,n}$$

Result (type 7, 82 leaves):

$$\frac{1}{20\,a^3\,c\,n}(c\,x)^{-5n/4}\left(-16\,a\,(a-5\,b\,x^n)-5\,b^2\,x^{5n/4}\,\text{RootSum}\left[b+a\,\#1^4\,\&,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1^3}\,\&\right]\right)$$

Problem 2792: Result unnecessarily involves higher level functions.

$$\int (c\,x)^{-1-2n-n\,p}\,(a+b\,x^n)^p\,dx$$

Optimal (type 3, 79 leaves, 2 steps):

$$-\frac{(c\,x)^{-n\,(2+p)}\,(a+b\,x^n)^{1+p}}{a\,c\,n\,(1+p)}+\frac{(c\,x)^{-n\,(2+p)}\,(a+b\,x^n)^{2+p}}{a^2\,c\,n\,(1+p)\,(2+p)}$$

Result (type 5, 69 leaves):

$$-\frac{1}{n\,(2+p)}x\,(c\,x)^{-1-n\,(2+p)}\,(a+b\,x^n)^p\left(1+\frac{b\,x^n}{a}\right)^{-p}\text{Hypergeometric2F1}\left[-2-p,\,-p,\,-1-p,\,-\frac{b\,x^n}{a}\right]$$

Problem 2793: Result unnecessarily involves higher level functions.

$$\int (c\,x)^{-1-3n-n\,p}\,(a+b\,x^n)^p\,dx$$

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

$$-\frac{(c\,x)^{-n\,(3+p)}\,(a+b\,x^n)^{1+p}}{a\,c\,n\,(1+p)}+\frac{2\,(c\,x)^{-n\,(3+p)}\,(a+b\,x^n)^{2+p}}{a^2\,c\,n\,(1+p)\,(2+p)}-\frac{2\,(c\,x)^{-n\,(3+p)}\,(a+b\,x^n)^{3+p}}{a^3\,c\,n\,(1+p)\,(2+p)\,(3+p)}$$

Result (type 5, 69 leaves):

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

Problem 2794: Result unnecessarily involves higher level functions.

$$\int (c\,x)^{-1-4\,n-n\,p}\,(a+b\,x^n)^p\,dx$$

Optimal (type 3, 179 leaves, 4 steps):

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

Result (type 5, 69 leaves):

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

Problem 2834: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\,\left(a+b\,(c+d\,x)^2\right)\,dx$$

Optimal (type 1, 31 leaves, 3 steps):

$$\frac{a\,(c+d\,x)^4}{4\,d}+\frac{b\,(c+d\,x)^6}{6\,d}$$

Result (type 1, 77 leaves):

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

Problem 2835: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\,\left(a+b\,(c+d\,x)^2\right)^2\,dx$$

Optimal (type 1, 51 leaves, 4 steps):

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

Result (type 1, 172 leaves):

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

Problem 2836: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^3 \left(a+b (c+d x)^2\right)^3 \, dx$$

Optimal (type 1, 48 leaves, 4 steps):

$$-\frac{a \left(a+b (c+d x)^2\right)^4}{8 b^2 d}+\frac{\left(a+b (c+d x)^2\right)^5}{10 b^2 d}$$

Result (type 1, 249 leaves):

$$c^3 \left(a+b c^2\right)^3 x+\frac{3}{2} c^2 \left(a+b c^2\right)^2 \left(a+3 b c^2\right) d x^2+c \left(a^3+10 a^2 b c^2+21 a b^2 c^4+12 b^3 c^6\right) d^2 x^3+\frac{1}{4} \left(a^3+30 a^2 b c^2+105 a b^2 c^4+84 b^3 c^6\right) d^3 x^4+\frac{3}{5} b c \left(5 a^2+35 a b c^2+42 b^2 c^4\right) d^4 x^5+\frac{1}{2} b \left(a^2+21 a b c^2+42 b^2 c^4\right) d^5 x^6+3 b^2 c \left(a+4 b c^2\right) d^6 x^7+\frac{3}{8} b^2 \left(a+12 b c^2\right) d^7 x^8+b^3 c d^8 x^9+\frac{1}{10} b^3 d^9 x^{10}$$

Problem 2846: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 31 leaves, 3 steps):

$$\frac{a (c+d x)^4}{4 d}+\frac{b (c+d x)^7}{7 d}$$

Result (type 1, 98 leaves):

$$c^3 \left(a+b c^3\right) x+\frac{3}{2} c^2 \left(a+2 b c^3\right) d x^2+c \left(a+5 b c^3\right) d^2 x^3+\frac{1}{4} \left(a+20 b c^3\right) d^3 x^4+3 b c^2 d^4 x^5+b c d^5 x^6+\frac{1}{7} b d^6 x^7$$

Problem 2847: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^3 \left(a+b (c+d x)^3\right)^2 \, dx$$

Optimal (type 1, 51 leaves, 3 steps):

$$\frac{a^2 (c+d x)^4}{4 d}+\frac{2 a b (c+d x)^7}{7 d}+\frac{b^2 (c+d x)^{10}}{10 d}$$

Result (type 1, 203 leaves):

$$c^3 \left(a+b c^3\right)^2 x+\frac{3}{2} c^2 \left(a^2+4 a b c^3+3 b^2 c^6\right) d x^2+c \left(a^2+10 a b c^3+12 b^2 c^6\right) d^2 x^3+\frac{1}{4} \left(a^2+40 a b c^3+84 b^2 c^6\right) d^3 x^4+\frac{6}{5} b c^2 \left(5 a+21 b c^3\right) d^4 x^5+b c \left(2 a+21 b c^3\right) d^5 x^6+\frac{2}{7} b \left(a+42 b c^3\right) d^6 x^7+\frac{9}{2} b^2 c^2 d^7 x^8+b^2 c d^8 x^9+\frac{1}{10} b^2 d^9 x^{10}$$

Problem 2848: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 71 leaves, 3 steps):

$$\frac{a^3 (c+d x)^4}{4 d}+\frac{3 a^2 b (c+d x)^7}{7 d}+\frac{3 a b^2 (c+d x)^{10}}{10 d}+\frac{b^3 (c+d x)^{13}}{13 d}$$

Result (type 1, 323 leaves):

$$c^3 \left(a+b c^3\right)^3 x+\frac{3}{2} c^2 \left(a+b c^3\right)^2 \left(a+4 b c^3\right) d x^2+c \left(a^3+15 a^2 b c^3+36 a b^2 c^6+22 b^3 c^9\right) d^2 x^3+\frac{1}{4} \left(a^3+60 a^2 b c^3+252 a b^2 c^6+220 b^3 c^9\right) d^3 x^4+\frac{9}{5} b c^2 \left(5 a^2+42 a b c^3+55 b^2 c^6\right) d^4 x^5+3 b c \left(a^2+21 a b c^3+44 b^2 c^6\right) d^5 x^6+\frac{3}{7} b \left(a^2+84 a b c^3+308 b^2 c^6\right) d^6 x^7+\frac{9}{2} b^2 c^2 \left(3 a+22 b c^3\right) d^7 x^8+b^2 c \left(3 a+55 b c^3\right) d^8 x^9+\frac{1}{10} b^2 \left(3 a+220 b c^3\right) d^9 x^{10}+6 b^3 c^2 d^{10} x^{11}+b^3 c d^{11} x^{12}+\frac{1}{13} b^3 d^{12} x^{13}$$

Problem 2849: Result more than twice size of optimal antiderivative.

$$\int (c e+d e x)^3 \left(a+b (c+d x)^3\right) \, dx$$

Optimal (type 1, 37 leaves, 3 steps):

$$\frac{a e^3 (c+d x)^4}{4 d}+\frac{b e^3 (c+d x)^7}{7 d}$$

Result (type 1, 102 leaves):

$$e^3 \left(c^3 \left(a+b c^3\right) x+\frac{3}{2} c^2 \left(a+2 b c^3\right) d x^2+c \left(a+5 b c^3\right) d^2 x^3+\frac{1}{4} \left(a+20 b c^3\right) d^3 x^4+3 b c^2 d^4 x^5+b c d^5 x^6+\frac{1}{7} b d^6 x^7\right)$$

Problem 2850: Result more than twice size of optimal antiderivative.

$$\int (c\,e + d\,e\,x)^3 \left(a + b\,(c + d\,x)^3\right)^2 \,dx$$

Optimal (type 1, 60 leaves, 3 steps):

$$\frac{a^2 e^3 (c + d x)^4}{4 d} + \frac{2 a b e^3 (c + d x)^7}{7 d} + \frac{b^2 e^3 (c + d x)^{10}}{10 d}$$

Result (type 1, 207 leaves):

$$e^3 \left(c^3 \left(a + b c^3\right)^2 x + \frac{3}{2} c^2 \left(a^2 + 4 a b c^3 + 3 b^2 c^6\right) d x^2 + c \left(a^2 + 10 a b c^3 + 12 b^2 c^6\right) d^2 x^3 + \frac{1}{4} \left(a^2 + 40 a b c^3 + 84 b^2 c^6\right) d^3 x^4 + \frac{6}{5} b c^2 \left(5 a + 21 b c^3\right) d^4 x^5 + b c \left(2 a + 21 b c^3\right) d^5 x^6 + \frac{2}{7} b \left(a + 42 b c^3\right) d^6 x^7 + \frac{9}{2} b^2 c^2 d^7 x^8 + b^2 c d^8 x^9 + \frac{1}{10} b^2 d^9 x^{10}\right)$$

Problem 2851: Result more than twice size of optimal antiderivative.

$$\int (c\,e + d\,e\,x)^3 \left(a + b\,(c + d\,x)^3\right)^3 \,dx$$

Optimal (type 1, 83 leaves, 3 steps):

$$\frac{a^3 e^3 (c + d x)^4}{4 d} + \frac{3 a^2 b e^3 (c + d x)^7}{7 d} + \frac{3 a b^2 e^3 (c + d x)^{10}}{10 d} + \frac{b^3 e^3 (c + d x)^{13}}{13 d}$$

Result (type 1, 327 leaves):

$$e^3 \left(c^3 \left(a + b c^3\right)^3 x + \frac{3}{2} c^2 \left(a + b c^3\right)^2 \left(a + 4 b c^3\right) d x^2 + c \left(a^3 + 15 a^2 b c^3 + 36 a b^2 c^6 + 22 b^3 c^9\right) d^2 x^3 + \frac{1}{4} \left(a^3 + 60 a^2 b c^3 + 252 a b^2 c^6 + 220 b^3 c^9\right) d^3 x^4 + \frac{9}{5} b c^2 \left(5 a^2 + 42 a b c^3 + 55 b^2 c^6\right) d^4 x^5 + 3 b c \left(a^2 + 21 a b c^3 + 44 b^2 c^6\right) d^5 x^6 + \frac{3}{7} b \left(a^2 + 84 a b c^3 + 308 b^2 c^6\right) d^6 x^7 + \frac{9}{2} b^2 c^2 \left(3 a + 22 b c^3\right) d^7 x^8 + b^2 c \left(3 a + 55 b c^3\right) d^8 x^9 + \frac{1}{10} b^2 \left(3 a + 220 b c^3\right) d^9 x^{10} + 6 b^3 c^2 d^{10} x^{11} + b^3 c d^{11} x^{12} + \frac{1}{13} b^3 d^{12} x^{13}\right)$$

Problem 2904: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 23 leaves, 3 steps):

$$\frac{\left(a + b (c + d x)^4\right)^2}{8 b d}$$

Result (type 1, 80 leaves):

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

Problem 2905: Result more than twice size of optimal antiderivative.

$$\int (c + d x)^3 \left(a + b (c + d x)^4\right)^2 dx$$

Optimal (type 1, 23 leaves, 2 steps):

$$\frac{\left(a + b (c + d x)^4\right)^3}{12 b d}$$

Result (type 1, 172 leaves):

$$\frac{1}{12} x \left(4 c^3 + 6 c^2 d x + 4 c d^2 x^2 + d^3 x^3\right) \left(3 a^2 + 3 a b \left(2 c^4 + 4 c^3 d x + 6 c^2 d^2 x^2 + 4 c d^3 x^3 + d^4 x^4\right) + b^2 \left(3 c^8 + 12 c^7 d x + 34 c^6 d^2 x^2 + 60 c^5 d^3 x^3 + 71 c^4 d^4 x^4 + 56 c^3 d^5 x^5 + 28 c^2 d^6 x^6 + 8 c d^7 x^7 + d^8 x^8\right)\right)$$

Problem 2906: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 23 leaves, 2 steps):

$$\frac{\left(a + b (c + d x)^4\right)^4}{16 b d}$$

Result (type 1, 308 leaves):

$$\frac{1}{16} x \left(4 c^3 + 6 c^2 d x + 4 c d^2 x^2 + d^3 x^3\right) \left(4 a^3 + 6 a^2 b \left(2 c^4 + 4 c^3 d x + 6 c^2 d^2 x^2 + 4 c d^3 x^3 + d^4 x^4\right) + 4 a b^2 \left(3 c^8 + 12 c^7 d x + 34 c^6 d^2 x^2 + 60 c^5 d^3 x^3 + 71 c^4 d^4 x^4 + 56 c^3 d^5 x^5 + 28 c^2 d^6 x^6 + 8 c d^7 x^7 + d^8 x^8\right) + b^3 \left(4 c^{12} + 24 c^{11} d x + 100 c^{10} d^2 x^2 + 280 c^9 d^3 x^3 + 566 c^8 d^4 x^4 + 848 c^7 d^5 x^5 + 952 c^6 d^6 x^6 + 800 c^5 d^7 x^7 + 496 c^4 d^8 x^8 + 220 c^3 d^9 x^9 + 66 c^2 d^{10} x^{10} + 12 c d^{11} x^{11} + d^{12} x^{12}\right)\right)$$

Problem 2910: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 111 leaves, 2 steps):

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

Result (type 4, 90 leaves) :

$$-\frac{i\sqrt{\frac{a+b(c+dx)^4}{a}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ (c+dx)\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\ d\sqrt{a+b(c+dx)^4}}$$

Problem 2911: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 154 leaves, 7 steps) :

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,(c+dx)^2}{\sqrt{a+b(c+dx)^4}}\right]}{2\sqrt{b}\,d^2}-\left(c\left(\sqrt{a}+\sqrt{b}\,(c+dx)^2\right)\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}\,(c+dx)^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}(c+dx)}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2\,a^{1/4}\,b^{1/4}\,d^2\sqrt{a+b(c+dx)^4}\right)$$

Result (type 4, 330 leaves) :

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

Problem 2922: Unable to integrate problem.

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

Optimal (type 3, 83 leaves, 7 steps):

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

Result (type 8, 13 leaves):

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

Problem 2926: Unable to integrate problem.

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

Optimal (type 3, 51 leaves, 4 steps):

$$2\sqrt{a+b\sqrt{c\,x^2}}-2\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^2}}}{\sqrt{a}}\right]$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x}\,dx$$

Problem 2927: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^3}\,dx$$

Optimal (type 3, 97 leaves, 5 steps):

$$-\frac{\sqrt{a+b\sqrt{c\,x^2}}}{2\,x^2}-\frac{b\,c\,\sqrt{a+b\sqrt{c\,x^2}}}{4\,a\,\sqrt{c\,x^2}}+\frac{b^2\,c\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^2}}}{\sqrt{a}}\right]}{4\,a^{3/2}}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^3}\,dx$$

Problem 2928: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^5}\,dx$$

Optimal (type 3, 171 leaves, 7 steps):

$$-\frac{\sqrt{a+b\sqrt{c x^2}}}{4 x^4}+\frac{5 b^2 c \sqrt{a+b\sqrt{c x^2}}}{96 a^2 x^2}-\frac{b c^2 \sqrt{a+b\sqrt{c x^2}}}{24 a \left(c x^2\right)^{3/2}}-\frac{5 b^3 c^2 \sqrt{a+b\sqrt{c x^2}}}{64 a^3 \sqrt{c x^2}}+\frac{5 b^4 c^2 \text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c x^2}}}{\sqrt{a}}\right]}{64 a^{7/2}}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c x^2}}}{x^5}\, dx$$

Problem 2929: Unable to integrate problem.

$$\int x^4 \sqrt{a+b\sqrt{c x^2}}\, dx$$

Optimal (type 2, 191 leaves, 3 steps):

$$\frac{2 a^4 x^5 \left(a+b\sqrt{c x^2}\right)^{3/2}}{3 b^5 \left(c x^2\right)^{5/2}}-\frac{8 a^3 x^5 \left(a+b\sqrt{c x^2}\right)^{5/2}}{5 b^5 \left(c x^2\right)^{5/2}}+\frac{12 a^2 x^5 \left(a+b\sqrt{c x^2}\right)^{7/2}}{7 b^5 \left(c x^2\right)^{5/2}}-\frac{8 a x^5 \left(a+b\sqrt{c x^2}\right)^{9/2}}{9 b^5 \left(c x^2\right)^{5/2}}+\frac{2 x^5 \left(a+b\sqrt{c x^2}\right)^{11/2}}{11 b^5 \left(c x^2\right)^{5/2}}$$

Result (type 8, 23 leaves):

$$\int x^4 \sqrt{a+b\sqrt{c x^2}}\, dx$$

Problem 2930: Unable to integrate problem.

$$\int x^2 \sqrt{a+b\sqrt{c x^2}}\, dx$$

Optimal (type 2, 113 leaves, 3 steps):

$$\frac{2 a^2 x^3 \left(a+b\sqrt{c x^2}\right)^{3/2}}{3 b^3 \left(c x^2\right)^{3/2}}-\frac{4 a x^3 \left(a+b\sqrt{c x^2}\right)^{5/2}}{5 b^3 \left(c x^2\right)^{3/2}}+\frac{2 x^3 \left(a+b\sqrt{c x^2}\right)^{7/2}}{7 b^3 \left(c x^2\right)^{3/2}}$$

Result (type 8, 23 leaves):

$$\int x^2 \sqrt{a+b\sqrt{c x^2}}\, dx$$

Problem 2932: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^2}\,dx$$

Optimal (type 3, 67 leaves, 4 steps):

$$-\frac{\sqrt{a+b\sqrt{c\,x^2}}}{x}-\frac{b\sqrt{c\,x^2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^2}}}{\sqrt{a}}\right]}{\sqrt{a}\,x}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^2}\,dx$$

Problem 2933: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^4}\,dx$$

Optimal (type 3, 144 leaves, 6 steps):

$$-\frac{\sqrt{a+b\sqrt{c\,x^2}}}{3\,x^3}+\frac{b^2\,c\,\sqrt{a+b\sqrt{c\,x^2}}}{8\,a^2\,x}-\frac{b\,\left(c\,x^2\right)^{3/2}\sqrt{a+b\sqrt{c\,x^2}}}{12\,a\,c\,x^5}-\frac{b^3\,\left(c\,x^2\right)^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^2}}}{\sqrt{a}}\right]}{8\,a^{5/2}\,x^3}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^4}\,dx$$

Problem 2934: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^2}}}{x^6}\,dx$$

Optimal (type 3, 219 leaves, 8 steps):

$$-\frac{\sqrt{a+b\sqrt{c\,x^2}}}{5\,x^5}+\frac{7\,b^2\,c\,\sqrt{a+b\sqrt{c\,x^2}}}{240\,a^2\,x^3}+\frac{7\,b^4\,c^2\,\sqrt{a+b\sqrt{c\,x^2}}}{128\,a^4\,x}-$$

$$\frac{b\,\left(c\,x^2\right)^{5/2}\sqrt{a+b\sqrt{c\,x^2}}}{40\,a\,c^2\,x^9}-\frac{7\,b^3\,\left(c\,x^2\right)^{5/2}\sqrt{a+b\sqrt{c\,x^2}}}{192\,a^3\,c\,x^7}-\frac{7\,b^5\,\left(c\,x^2\right)^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^2}}}{\sqrt{a}}\right]}{128\,a^{9/2}\,x^5}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a + b\sqrt{c\,x^2}}}{x^6}\,dx$$

Problem 2935: Unable to integrate problem.

$$\int x^8\sqrt{a + b\left(c\,x^2\right)^{3/2}}\,dx$$

Optimal (type 2, 113 leaves, 4 steps):

$$\frac{2\,a^2\,x^9\left(a + b\left(c\,x^2\right)^{3/2}\right)^{3/2}}{9\,b^3\left(c\,x^2\right)^{9/2}} - \frac{4\,a\,x^9\left(a + b\left(c\,x^2\right)^{3/2}\right)^{5/2}}{15\,b^3\left(c\,x^2\right)^{9/2}} + \frac{2\,x^9\left(a + b\left(c\,x^2\right)^{3/2}\right)^{7/2}}{21\,b^3\left(c\,x^2\right)^{9/2}}$$

Result (type 8, 23 leaves):

$$\int x^8\sqrt{a + b\left(c\,x^2\right)^{3/2}}\,dx$$

Problem 2936: Unable to integrate problem.

$$\int x^5\sqrt{a + b\left(c\,x^2\right)^{3/2}}\,dx$$

Optimal (type 2, 56 leaves, 4 steps):

$$-\frac{2\,a\left(a + b\left(c\,x^2\right)^{3/2}\right)^{3/2}}{9\,b^2\,c^3} + \frac{2\left(a + b\left(c\,x^2\right)^{3/2}\right)^{5/2}}{15\,b^2\,c^3}$$

Result (type 8, 23 leaves):

$$\int x^5\sqrt{a + b\left(c\,x^2\right)^{3/2}}\,dx$$

Problem 2938: Unable to integrate problem.

$$\int \frac{\sqrt{a + b\left(c\,x^2\right)^{3/2}}}{x}\,dx$$

Optimal (type 3, 55 leaves, 5 steps):

$$\frac{2}{3}\sqrt{a + b\left(c\,x^2\right)^{3/2}} - \frac{2}{3}\sqrt{a}\,\mathrm{ArcTanh}\left[\frac{\sqrt{a + b\left(c\,x^2\right)^{3/2}}}{\sqrt{a}}\right]$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\,(c\,x^2)^{3/2}}}{x}\,dx$$

Problem 2939: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\,(c\,x^2)^{3/2}}}{x^4}\,dx$$

Optimal (type 3, 71 leaves, 5 steps):

$$-\frac{\sqrt{a+b\,(c\,x^2)^{3/2}}}{3\,x^3}-\frac{b\,(c\,x^2)^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,(c\,x^2)^{3/2}}}{\sqrt{a}}\right]}{3\,\sqrt{a}\,x^3}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\,(c\,x^2)^{3/2}}}{x^4}\,dx$$

Problem 2940: Result unnecessarily involves higher level functions.

$$\int x^3\,\sqrt{a+b\,(c\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 340 leaves, 4 steps):

$$\frac{2}{11}\,x^4\,\sqrt{a+b\,(c\,x^2)^{3/2}}+\frac{6\,a\,\sqrt{c\,x^2}\,\sqrt{a+b\,(c\,x^2)^{3/2}}}{55\,b\,c^2}-\left(4\times 3^{3/4}\,\sqrt{2+\sqrt{3}}\,a^2\,\left(a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}\right)\,\sqrt{\frac{a^{2/3}+b^{2/3}\,c\,x^2-a^{1/3}\,b^{1/3}\,\sqrt{c\,x^2}}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}}{\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/$$
$$\left(55\,b^{4/3}\,c^2\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+b^{1/3}\,\sqrt{c\,x^2}\right)^2}}\,\sqrt{a+b\,(c\,x^2)^{3/2}}\right)$$

Result (type 5, 132 leaves):

$$\left(16 a b c^2 x^4 + 6 a^2 \sqrt{c x^2} + 10 b^2 c^3 x^6 \sqrt{c x^2} - 6 a^2 \sqrt{c x^2} \sqrt{\frac{a + b \left(c x^2\right)^{3/2}}{a}} \right.$$
$$\left. \text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{2}, \frac{4}{3}, -\frac{b \left(c x^2\right)^{3/2}}{a}\right]\right) \Big/ \left(55 b c^2 \sqrt{a + b \left(c x^2\right)^{3/2}}\right)$$

Problem 2941: Unable to integrate problem.

$$\int \sqrt{a + b \left(c x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 306 leaves, 3 steps):

$$\frac{2}{5} x \sqrt{a + b \left(c x^2\right)^{3/2}} + \left(2 \times 3^{3/4} \sqrt{2 + \sqrt{3}} \; a x \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3} + b^{2/3} c x^2 - a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}} \right.$$
$$\left. \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1 - \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}{\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}\right], -7 - 4 \sqrt{3}\right]\right) \Big/$$
$$\left(5 b^{1/3} \sqrt{c x^2} \sqrt{\frac{a^{1/3} \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a + b \left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 19 leaves):

$$\int \sqrt{a + b \left(c x^2\right)^{3/2}} \, dx$$

Problem 2942: Unable to integrate problem.

$$\int \frac{\sqrt{a + b \left(c x^2\right)^{3/2}}}{x^3} \, dx$$

Optimal (type 4, 298 leaves, 3 steps):

$$-\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{2 x^2}+\left(3^{3/4}\sqrt{2+\sqrt{3}}\; b^{2/3} c\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)\sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3}\sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}}\right],-7-4\sqrt{3}\right]\right)\bigg/$$

$$\left(2\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\sqrt{a+b\left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 23 leaves):

$$\int\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^3}\,dx$$

Problem 2943: Unable to integrate problem.

$$\int\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^6}\,dx$$

Optimal (type 4, 352 leaves, 4 steps):

$$-\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{5 x^5}-\frac{3 b\left(c x^2\right)^{5/2}\sqrt{a+b\left(c x^2\right)^{3/2}}}{20 a c x^7}-$$

$$\left(3^{3/4}\sqrt{2+\sqrt{3}}\; b^{5/3}\left(c x^2\right)^{5/2}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)\sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3}\sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}}\right],-7-4\sqrt{3}\right]\right)\bigg/$$

$$\left(20 a x^5\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\sqrt{a+b\left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 23 leaves):

$$\int\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^6}\,dx$$

Problem 2944: Unable to integrate problem.

$$\int x^4 \sqrt{a+b\left(c x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 709 leaves, 6 steps):

$$\frac{2}{13} x^5 \sqrt{a+b\left(c x^2\right)^{3/2}}+\frac{6 a c x^7 \sqrt{a+b\left(c x^2\right)^{3/2}}}{91 b \left(c x^2\right)^{5/2}}-\frac{24 a^2 x^5 \sqrt{a+b\left(c x^2\right)^{3/2}}}{91 b^{5/3} \left(c x^2\right)^{5/2} \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}+$$
$$\left(12\times 3^{1/4} \sqrt{2-\sqrt{3}}\; a^{7/3} x^5 \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(91 b^{5/3} \left(c x^2\right)^{5/2} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a+b\left(c x^2\right)^{3/2}}\right)-$$
$$\left(8 \sqrt{2}\; 3^{3/4} a^{7/3} x^5 \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(91 b^{5/3} \left(c x^2\right)^{5/2} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a+b\left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 23 leaves):

$$\int x^4 \sqrt{a+b\left(c x^2\right)^{3/2}}\, dx$$

Problem 2945: Result unnecessarily involves higher level functions.

$$\int x \sqrt{a+b\left(c x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 642 leaves, 5 steps):

$$\frac{2}{7} x^2 \sqrt{a + b \left(c x^2\right)^{3/2}} + \frac{6 a \sqrt{a + b \left(c x^2\right)^{3/2}}}{7 b^{2/3} c \left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)} -$$

$$\left(3 \times 3^{1/4} \sqrt{2 - \sqrt{3}}\ a^{4/3} \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3} + b^{2/3} c x^2 - a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1 - \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}{\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}\right], -7 - 4 \sqrt{3}\right]\right) \Big/$$

$$\left(7 b^{2/3} c \sqrt{\frac{a^{1/3} \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a + b \left(c x^2\right)^{3/2}}\right) +$$

$$\left(2 \sqrt{2}\ 3^{3/4} a^{4/3} \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3} + b^{2/3} c x^2 - a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1 - \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}{\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}}\right], -7 - 4 \sqrt{3}\right]\right) \Big/$$

$$\left(7 b^{2/3} c \sqrt{\frac{a^{1/3} \left(a^{1/3} + b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1 + \sqrt{3}\right) a^{1/3} + b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a + b \left(c x^2\right)^{3/2}}\right)$$

Result (type 5, 89 leaves):

$$\left(x^2 \left(4 \left(a + b \left(c x^2\right)^{3/2}\right) + 3 a \sqrt{\frac{a + b \left(c x^2\right)^{3/2}}{a}}\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{2}{3}, \frac{5}{3}, -\frac{b \left(c x^2\right)^{3/2}}{a}\right]\right)\right) \Big/$$

$$\left(14 \sqrt{a + b \left(c x^2\right)^{3/2}}\right)$$

Problem 2946: Unable to integrate problem.

$$\int \frac{\sqrt{a + b \left(c x^2\right)^{3/2}}}{x^2}\, dx$$

Optimal (type 4, 661 leaves, 5 steps):

$$-\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x}+\frac{3 b^{1/3}\sqrt{c x^2}\sqrt{a+b\left(c x^2\right)^{3/2}}}{x\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}\right)}-$$

$$\left(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{1/3}b^{1/3}\sqrt{c x^2}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)\sqrt{\frac{a^{2/3}+b^{2/3}c x^2-a^{1/3}b^{1/3}\sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(2 x\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\sqrt{a+b\left(c x^2\right)^{3/2}}\right)+$$

$$\left(\sqrt{2}\;3^{3/4}a^{1/3}b^{1/3}\sqrt{c x^2}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)\sqrt{\frac{a^{2/3}+b^{2/3}c x^2-a^{1/3}b^{1/3}\sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(x\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\sqrt{c x^2}\right)^2}}\sqrt{a+b\left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 23 leaves):

$$\int\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^2}\,dx$$

Problem 2947: Unable to integrate problem.

$$\int\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^5}\,dx$$

Optimal (type 4, 681 leaves, 6 steps):

$$-\frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{4 x^4}-\frac{3 b c^2 \sqrt{a+b\left(c x^2\right)^{3/2}}}{8 a \sqrt{c x^2}}+\frac{3 b^{4/3} c^2 \sqrt{a+b\left(c x^2\right)^{3/2}}}{8 a \left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}-$$

$$\left(3\times 3^{1/4} \sqrt{2-\sqrt{3}}\; b^{4/3} c^2 \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$

$$\left(16 a^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a+b\left(c x^2\right)^{3/2}}\right)+$$

$$\left(3^{3/4} b^{4/3} c^2 \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^2-a^{1/3} b^{1/3} \sqrt{c x^2}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$

$$\left(4 \sqrt{2}\; a^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} \sqrt{c x^2}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^2}\right)^2}} \sqrt{a+b\left(c x^2\right)^{3/2}}\right)$$

Result (type 8, 23 leaves) :

$$\int \frac{\sqrt{a+b\left(c x^2\right)^{3/2}}}{x^5}\, dx$$

Problem 2948: Unable to integrate problem.

$$\int (d x)^m \sqrt{a+b\left(c x^2\right)^{3/2}}\, dx$$

Optimal (type 5, 86 leaves, 3 steps) :

$$\left((d x)^{1+m} \sqrt{a+b\left(c x^2\right)^{3/2}}\; \text{Hypergeometric2F1}\left[-\frac{1}{2},\frac{1+m}{3},\frac{4+m}{3},-\frac{b\left(c x^2\right)^{3/2}}{a}\right]\right)\Big/$$

$$\left(d\,(1+m) \sqrt{1+\frac{b\left(c x^2\right)^{3/2}}{a}}\right)$$

Result (type 8, 25 leaves) :

$$\int (d\,x)^m \sqrt{a+b\,\left(c\,x^2\right)^{3/2}}\,dx$$

Problem 2951: Unable to integrate problem.

$$\int (d\,x)^m \sqrt{a+\frac{b}{\left(c\,x^2\right)^{3/2}}}\,dx$$

Optimal (type 5, 90 leaves, 4 steps):

$$\left((d\,x)^{1+m}\sqrt{a+\frac{b}{\left(c\,x^2\right)^{3/2}}}\;\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{1}{3}\,(-1-m),\,\frac{2-m}{3},\,-\frac{b}{a\,\left(c\,x^2\right)^{3/2}}\right]\right)\Big/\left(d\,(1+m)\sqrt{1+\frac{b}{a\,\left(c\,x^2\right)^{3/2}}}\right)$$

Result (type 8, 25 leaves):

$$\int (d\,x)^m \sqrt{a+\frac{b}{\left(c\,x^2\right)^{3/2}}}\,dx$$

Problem 2952: Unable to integrate problem.

$$\int \frac{1}{1+\left(x^3\right)^{2/3}}\,dx$$

Optimal (type 3, 17 leaves, 2 steps):

$$\frac{x\,\text{ArcTan}\left[\left(x^3\right)^{1/3}\right]}{\left(x^3\right)^{1/3}}$$

Result (type 8, 13 leaves):

$$\int \frac{1}{1+\left(x^3\right)^{2/3}}\,dx$$

Problem 2955: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\,\sqrt{c\,x^3}}}{x}\,dx$$

Optimal (type 3, 55 leaves, 5 steps):

$$\frac{4}{3}\sqrt{a+b\,\sqrt{c\,x^3}}\;-\;\frac{4}{3}\,\sqrt{a}\;\text{ArcTanh}\left[\frac{\sqrt{a+b\,\sqrt{c\,x^3}}}{\sqrt{a}}\right]$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a + b\sqrt{c\,x^3}}}{x}\,dx$$

Problem 2956: Unable to integrate problem.

$$\int \frac{\sqrt{a + b\sqrt{c\,x^3}}}{x^4}\,dx$$

Optimal (type 3, 97 leaves, 6 steps):

$$-\frac{\sqrt{a + b\sqrt{c\,x^3}}}{3\,x^3} - \frac{b\,c\,\sqrt{a + b\sqrt{c\,x^3}}}{6\,a\,\sqrt{c\,x^3}} + \frac{b^2\,c\,\text{ArcTanh}\left[\frac{\sqrt{a+b\sqrt{c\,x^3}}}{\sqrt{a}}\right]}{6\,a^{3/2}}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a + b\sqrt{c\,x^3}}}{x^4}\,dx$$

Problem 2957: Unable to integrate problem.

$$\int x\,\sqrt{a + b\sqrt{c\,x^3}}\,dx$$

Optimal (type 4, 400 leaves, 5 steps):

$$\frac{4}{11} x^2 \sqrt{a+b\sqrt{c\,x^3}} + \frac{12\,a\,x^2\sqrt{a+b\sqrt{c\,x^3}}}{55\,b\sqrt{c\,x^3}} - \left(8\times 3^{3/4}\sqrt{2+\sqrt{3}}\;a^2\left(a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3}c^{1/3}x-\frac{a^{1/3}b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(55\,b^{4/3}c^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}c^{2/3}x^2}{\sqrt{c\,x^3}}\right)^2}}\sqrt{a+b\sqrt{c\,x^3}}\right)$$

Result (type 8, 21 leaves):

$$\int x\sqrt{a+b\sqrt{c\,x^3}}\,dx$$

Problem 2958: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{c\,x^3}}}{x^2}\,dx$$

Optimal (type 4, 355 leaves, 4 steps):

$$-\frac{\sqrt{a+b\sqrt{c\,x^3}}}{x}+\left(3^{3/4}\sqrt{2+\sqrt{3}}\;b^{2/3}\,c^{1/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\right.$$

$$\left.\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\sqrt{3}\right]\right)\Bigg/$$

$$\left(\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\;\sqrt{a+b\sqrt{c\,x^3}}\right)$$

Result (type 8, 23 leaves) :

$$\int\frac{\sqrt{a+b\sqrt{c\,x^3}}}{x^2}\,dx$$

Problem 2959: Unable to integrate problem.

$$\int\frac{\sqrt{a+b\sqrt{c\,x^3}}}{x^5}\,dx$$

Optimal (type 4, 434 leaves, 6 steps) :

$$-\frac{\sqrt{a+b\sqrt{c\,x^3}}}{4\,x^4}+\frac{21\,b^2\,c\,\sqrt{a+b\sqrt{c\,x^3}}}{160\,a^2\,x}-\frac{3\,b\,c^3\,x^5\,\sqrt{a+b\sqrt{c\,x^3}}}{40\,a\,\left(c\,x^3\right)^{5/2}}+$$

$$\left(7\times 3^{3/4}\,\sqrt{2+\sqrt{3}}\;b^{8/3}\,c^{4/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(160\,a^2\,\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\;\sqrt{a+b\sqrt{c\,x^3}}\right)$$

Result (type 8, 23 leaves):

$$\int\frac{\sqrt{a+b\sqrt{c\,x^3}}}{x^5}\,dx$$

Problem 2960: Unable to integrate problem.

$$\int x^3\,\sqrt{a+b\sqrt{c\,x^3}}\;dx$$

Optimal (type 4, 843 leaves, 8 steps):

$$-\frac{120\,a^2\,x\,\sqrt{a+b\,\sqrt{c\,x^3}}}{1729\,b^2\,c}+\frac{4}{19}\,x^4\,\sqrt{a+b\,\sqrt{c\,x^3}}+$$

$$\frac{12\,a\,x\,\sqrt{c\,x^3}\,\sqrt{a+b\,\sqrt{c\,x^3}}}{247\,b\,c}+\frac{480\,a^3\,\sqrt{a+b\,\sqrt{c\,x^3}}}{1729\,b^{8/3}\,c^{4/3}\,\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}-$$

$$\left(240\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,\,a^{10/3}\,\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\,\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\,b^{8/3}\,c^{4/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\,\sqrt{a+b\,\sqrt{c\,x^3}}\right)+$$

$$\left(160\,\sqrt{2}\,\,3^{3/4}\,a^{10/3}\,\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\,\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\,b^{8/3}\,c^{4/3}\,\sqrt{\frac{a^{1/3}\,\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)\,a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\,\sqrt{a+b\,\sqrt{c\,x^3}}\right)$$

Result (type 8, 23 leaves) :

$$\int x^3\,\sqrt{a+b\,\sqrt{c\,x^3}}\,\,dx$$

Problem 2961: Unable to integrate problem.

$$\int \sqrt{a+b\sqrt{c\,x^3}}\,dx$$

Optimal (type 4, 770 leaves, 6 steps):

$$\frac{4}{7}x\sqrt{a+b\sqrt{c\,x^3}}+\frac{12\,a\sqrt{a+b\sqrt{c\,x^3}}}{7\,b^{2/3}\,c^{1/3}\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}-$$

$$\left(6\times 3^{1/4}\sqrt{2-\sqrt{3}}\;a^{4/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(7\,b^{2/3}\,c^{1/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\sqrt{a+b\sqrt{c\,x^3}}\right)+$$

$$\left(4\sqrt{2}\;3^{3/4}\,a^{4/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3}\,c^{1/3}\,x-\frac{a^{1/3}\,b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}{\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}}\right],\,-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(7\,b^{2/3}\,c^{1/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+\frac{b^{1/3}\,c^{2/3}\,x^2}{\sqrt{c\,x^3}}\right)^2}}\sqrt{a+b\sqrt{c\,x^3}}\right)$$

Result (type 8, 19 leaves):

$$\int \sqrt{a + b \sqrt{c x^3}} \, dx$$

Problem 2962: Unable to integrate problem.

$$\int \frac{\sqrt{a + b \sqrt{c x^3}}}{x^3} \, dx$$

Optimal (type 4, 810 leaves, 7 steps) :

$$-\frac{\sqrt{a+b\sqrt{c x^3}}}{2 x^2}-\frac{3 b c x \sqrt{a+b\sqrt{c x^3}}}{4 a \sqrt{c x^3}}+\frac{3 b^{4/3} c^{2/3} \sqrt{a+b\sqrt{c x^3}}}{4 a \left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)}-$$

$$\left(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\; b^{4/3} c^{2/3}\left(a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3} c^{1/3} x-\frac{a^{1/3} b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}{\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(8 a^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)^2}}\sqrt{a+b\sqrt{c x^3}}\right)+$$

$$\left(3^{3/4} b^{4/3} c^{2/3}\left(a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)\sqrt{\frac{a^{2/3}+b^{2/3} c^{1/3} x-\frac{a^{1/3} b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}{\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(2\sqrt{2}\, a^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+\frac{b^{1/3} c^{2/3} x^2}{\sqrt{c x^3}}\right)^2}}\sqrt{a+b\sqrt{c x^3}}\right)$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\sqrt{c x^3}}}{x^3}\,dx$$

Problem 2963: Unable to integrate problem.

$$\int x^{17}\sqrt{a+b\left(c\,x^3\right)^{3/2}}\,dx$$

Optimal (type 2, 116 leaves, 4 steps):

$$-\frac{4\,a^3\left(a+b\left(c\,x^3\right)^{3/2}\right)^{3/2}}{27\,b^4\,c^6}+\frac{4\,a^2\left(a+b\left(c\,x^3\right)^{3/2}\right)^{5/2}}{15\,b^4\,c^6}-\frac{4\,a\left(a+b\left(c\,x^3\right)^{3/2}\right)^{7/2}}{21\,b^4\,c^6}+\frac{4\left(a+b\left(c\,x^3\right)^{3/2}\right)^{9/2}}{81\,b^4\,c^6}$$

Result (type 8, 23 leaves):

$$\int x^{17}\sqrt{a+b\left(c\,x^3\right)^{3/2}}\,dx$$

Problem 2964: Unable to integrate problem.

$$\int x^8\sqrt{a+b\left(c\,x^3\right)^{3/2}}\,dx$$

Optimal (type 2, 56 leaves, 4 steps):

$$-\frac{4\,a\left(a+b\left(c\,x^3\right)^{3/2}\right)^{3/2}}{27\,b^2\,c^3}+\frac{4\left(a+b\left(c\,x^3\right)^{3/2}\right)^{5/2}}{45\,b^2\,c^3}$$

Result (type 8, 23 leaves):

$$\int x^8\sqrt{a+b\left(c\,x^3\right)^{3/2}}\,dx$$

Problem 2965: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{x}\,dx$$

Optimal (type 3, 55 leaves, 5 steps):

$$\frac{4}{9}\sqrt{a+b\left(c\,x^3\right)^{3/2}}-\frac{4}{9}\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{\sqrt{a}}\right]$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{x}\,dx$$

Problem 2966: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{x^{10}}\,dx$$

Optimal (type 3, 101 leaves, 6 steps):

$$-\frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{9\,x^9}-\frac{b\,c^3\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{18\,a\left(c\,x^3\right)^{3/2}}+\frac{b^2\,c^3\,\text{ArcTanh}\left[\frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{\sqrt{a}}\right]}{18\,a^{3/2}}$$

Result (type 8, 23 leaves):

$$\int \frac{\sqrt{a+b\left(c\,x^3\right)^{3/2}}}{x^{10}}\,dx$$

Problem 2967: Result unnecessarily involves higher level functions.

$$\int x^2\sqrt{a+b\left(c\,x^3\right)^{3/2}}\,dx$$

Optimal (type 4, 642 leaves, 7 steps):

$$\frac{4}{21} x^3 \sqrt{a+b\left(c x^3\right)^{3/2}}+\frac{4 a \sqrt{a+b\left(c x^3\right)^{3/2}}}{7 b^{2/3} c\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}\right)}-$$

$$\left(2\times 3^{1/4} \sqrt{2-\sqrt{3}}\ a^{4/3}\left(a^{1/3}+b^{1/3} \sqrt{c x^3}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^3-a^{1/3} b^{1/3} \sqrt{c x^3}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$

$$\left(7 b^{2/3} c \sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3} \sqrt{c x^3}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}\right)^2}} \sqrt{a+b\left(c x^3\right)^{3/2}}\right)+$$

$$\left(4 \sqrt{2}\ a^{4/3}\left(a^{1/3}+b^{1/3} \sqrt{c x^3}\right) \sqrt{\frac{a^{2/3}+b^{2/3} c x^3-a^{1/3} b^{1/3} \sqrt{c x^3}}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$

$$\left(7\times 3^{1/4} b^{2/3} c \sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3} \sqrt{c x^3}\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} \sqrt{c x^3}\right)^2}} \sqrt{a+b\left(c x^3\right)^{3/2}}\right)$$

Result (type 5, 89 leaves) :

$$\left(x^3\left(4\left(a+b\left(c x^3\right)^{3/2}\right)+3 a \sqrt{\frac{a+b\left(c x^3\right)^{3/2}}{a}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{5}{3},-\frac{b\left(c x^3\right)^{3/2}}{a}\right]\right)\right)\Big/$$

$$\left(21 \sqrt{a+b\left(c x^3\right)^{3/2}}\right)$$

Problem 2968: Unable to integrate problem.

$$\int x^9 \sqrt{a+b\left(c x^3\right)^{3/2}}\, dx$$

Optimal (type 5, 170 leaves, 7 steps) :

$$-\frac{792\,a^2\,x\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{19\,747\,b^2\,c^3}+\frac{4}{49}\,x^{10}\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}+\frac{36\,a\,x\,\left(c\,x^3\right)^{3/2}\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{1519\,b\,c^3}+$$
$$\frac{792\,a^3\,x\,\sqrt{1+\frac{b\,\left(c\,x^3\right)^{3/2}}{a}}\;\text{Hypergeometric2F1}\left[\frac{2}{9},\frac{1}{2},\frac{11}{9},-\frac{b\,\left(c\,x^3\right)^{3/2}}{a}\right]}{19\,747\,b^2\,c^3\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}$$

Result (type 8, 23 leaves) :

$$\int x^9\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\,dx$$

Problem 2969: Unable to integrate problem.

$$\int\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\,dx$$

Optimal (type 5, 91 leaves, 5 steps) :

$$\frac{4}{13}\,x\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}+\frac{9\,a\,x\,\sqrt{1+\frac{b\,\left(c\,x^3\right)^{3/2}}{a}}\;\text{Hypergeometric2F1}\left[\frac{2}{9},\frac{1}{2},\frac{11}{9},-\frac{b\,\left(c\,x^3\right)^{3/2}}{a}\right]}{13\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}$$

Result (type 8, 19 leaves) :

$$\int\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\,dx$$

Problem 2970: Unable to integrate problem.

$$\int\frac{\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{x^9}\,dx$$

Optimal (type 5, 139 leaves, 6 steps) :

$$-\frac{\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{8\,x^8}-\frac{9\,b\,c^3\,x\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{112\,a\,\left(c\,x^3\right)^{3/2}}-$$
$$\frac{45\,b^2\,c^3\,x\,\sqrt{1+\frac{b\,\left(c\,x^3\right)^{3/2}}{a}}\;\text{Hypergeometric2F1}\left[\frac{2}{9},\frac{1}{2},\frac{11}{9},-\frac{b\,\left(c\,x^3\right)^{3/2}}{a}\right]}{448\,a\,\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}$$

Result (type 8, 23 leaves) :

$$\int\frac{\sqrt{a+b\,\left(c\,x^3\right)^{3/2}}}{x^9}\,dx$$

Problem 2971: Unable to integrate problem.

$$\int (d\,x)^m \sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\,dx$$

Optimal (type 5, 84 leaves, 5 steps):

$$\left(x\,(d\,x)^m \sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\;\text{Hypergeometric2F1}\left[-\frac{1}{2},\frac{2\,(1+m)}{9},1+\frac{2\,(1+m)}{9},-\frac{b\,\left(c\,x^3\right)^{3/2}}{a}\right]\right)\Big/\left((1+m)\,\sqrt{1+\frac{b\,\left(c\,x^3\right)^{3/2}}{a}}\right)$$

Result (type 8, 25 leaves):

$$\int (d\,x)^m \sqrt{a+b\,\left(c\,x^3\right)^{3/2}}\,dx$$

Problem 2974: Unable to integrate problem.

$$\int (d\,x)^m \sqrt{a+\frac{b}{\left(c\,x^3\right)^{3/2}}}\,dx$$

Optimal (type 5, 102 leaves, 6 steps):

$$\left(x\,(d\,x)^m \sqrt{a+\frac{b\,c^3\,x^9}{\left(c\,x^3\right)^{9/2}}}\;\text{Hypergeometric2F1}\left[-\frac{1}{2},-\frac{2}{9}\,(1+m),\frac{1}{9}\,(7-2\,m),-\frac{b\,c^3\,x^9}{a\,\left(c\,x^3\right)^{9/2}}\right]\right)\Big/\left((1+m)\,\sqrt{1+\frac{b\,c^3\,x^9}{a\,\left(c\,x^3\right)^{9/2}}}\right)$$

Result (type 8, 25 leaves):

$$\int (d\,x)^m \sqrt{a+\frac{b}{\left(c\,x^3\right)^{3/2}}}\,dx$$

Problem 2988: Unable to integrate problem.

$$\int \sqrt{a+b\,\left(\frac{c}{x}\right)^{3/2}}\,(d\,x)^m\,dx$$

Optimal (type 5, 102 leaves, 6 steps):

$$\left(\sqrt{a+\frac{b\,c^3}{\left(\frac{c}{x}\right)^{3/2}x^3}}\;x\,(d\,x)^m\,\text{Hypergeometric2F1}\left[-\frac{1}{2},-\frac{2}{3}(1+m),\frac{1}{3}(1-2\,m),-\frac{b\,c^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right]\right)\Bigg/$$
$$\left((1+m)\sqrt{1+\frac{b\,c^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}}\right)$$

Result (type 8, 25 leaves):

$$\int\sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}\;(d\,x)^m\,dx$$

Problem 2991: Unable to integrate problem.

$$\int\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}\;(d\,x)^m\,dx$$

Optimal (type 5, 102 leaves, 5 steps):

$$\left(x\,(d\,x)^m\sqrt{a+\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{c^3}}\;\text{Hypergeometric2F1}\left[-\frac{1}{2},\frac{2(1+m)}{3},\frac{1}{3}(5+2\,m),-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{a\,c^3}\right]\right)\Bigg/$$
$$\left((1+m)\sqrt{1+\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{a\,c^3}}\right)$$

Result (type 8, 25 leaves):

$$\int\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}\;(d\,x)^m\,dx$$

Problem 2992: Unable to integrate problem.

$$\int\frac{(d\,x)^m}{\sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}}\,dx$$

Optimal (type 5, 102 leaves, 6 steps):

$$\left(\sqrt{1+\frac{b\,c^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}}\;x\,(d\,x)^m\,\text{Hypergeometric2F1}\left[\frac{1}{2},-\frac{2}{3}(1+m),\frac{1}{3}(1-2\,m),-\frac{b\,c^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right]\right)\Bigg/\left((1+m)\sqrt{a+\frac{b\,c^3}{\left(\frac{c}{x}\right)^{3/2}x^3}}\right)$$

Result (type 8, 25 leaves):

$$\int\frac{(d\,x)^m}{\sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}}\,dx$$

Problem 2995: Unable to integrate problem.

$$\int\frac{(d\,x)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}}\,dx$$

Optimal (type 5, 102 leaves, 5 steps):

$$\left(x\,(d\,x)^m\sqrt{1+\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{a\,c^3}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2\,(1+m)}{3},\frac{1}{3}(5+2\,m),-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{a\,c^3}\right]\right)\Bigg/\left((1+m)\sqrt{a+\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{c^3}}\right)$$

Result (type 8, 25 leaves):

$$\int\frac{(d\,x)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}}\,dx$$

Problem 2999: Unable to integrate problem.

$$\int\frac{x^3}{a+b\,(c\,x^n)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 101 leaves, 3 steps):

$$\frac{a^2\,x^4\,(c\,x^n)^{-3/n}}{b^3}-\frac{a\,x^4\,(c\,x^n)^{-2/n}}{2\,b^2}+\frac{x^4\,(c\,x^n)^{-1/n}}{3\,b}-\frac{a^3\,x^4\,(c\,x^n)^{-4/n}\,\text{Log}\left[a+b\,(c\,x^n)^{\frac{1}{n}}\right]}{b^4}$$

Result (type 8, 21 leaves):

$$\int \frac{x^3}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Problem 3000: Unable to integrate problem.

$$\int \frac{x^2}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 77 leaves, 3 steps):

$$-\frac{a\,x^3\left(c\,x^n\right)^{-2/n}}{b^2}+\frac{x^3\left(c\,x^n\right)^{-1/n}}{2\,b}+\frac{a^2\,x^3\left(c\,x^n\right)^{-3/n}\,\mathrm{Log}\left[a+b\left(c\,x^n\right)^{\frac{1}{n}}\right]}{b^3}$$

Result (type 8, 21 leaves):

$$\int \frac{x^2}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Problem 3001: Unable to integrate problem.

$$\int \frac{x}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 53 leaves, 3 steps):

$$\frac{x^2\left(c\,x^n\right)^{-1/n}}{b}-\frac{a\,x^2\left(c\,x^n\right)^{-2/n}\,\mathrm{Log}\left[a+b\left(c\,x^n\right)^{\frac{1}{n}}\right]}{b^2}$$

Result (type 8, 19 leaves):

$$\int \frac{x}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Problem 3004: Unable to integrate problem.

$$\int \frac{1}{x^2\left(a+b\left(c\,x^n\right)^{\frac{1}{n}}\right)}\,dx$$

Optimal (type 3, 60 leaves, 3 steps):

$$-\frac{1}{a\,x}-\frac{b\left(c\,x^n\right)^{\frac{1}{n}}\,\mathrm{Log}[x]}{a^2\,x}+\frac{b\left(c\,x^n\right)^{\frac{1}{n}}\,\mathrm{Log}\left[a+b\left(c\,x^n\right)^{\frac{1}{n}}\right]}{a^2\,x}$$

Result (type 8, 21 leaves):

$$\int \frac{1}{x^2 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)} \, dx$$

Problem 3005: Unable to integrate problem.

$$\int \frac{1}{x^3 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)} \, dx$$

Optimal (type 3, 87 leaves, 3 steps):

$$-\frac{1}{2 a x^2}+\frac{b \left(c x^n\right)^{\frac{1}{n}}}{a^2 x^2}+\frac{b^2 \left(c x^n\right)^{2/n} \text{Log}[x]}{a^3 x^2}-\frac{b^2 \left(c x^n\right)^{2/n} \text{Log}\left[a+b \left(c x^n\right)^{\frac{1}{n}}\right]}{a^3 x^2}$$

Result (type 8, 21 leaves):

$$\int \frac{1}{x^3 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)} \, dx$$

Problem 3006: Unable to integrate problem.

$$\int \frac{x^3}{\left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Optimal (type 3, 114 leaves, 3 steps):

$$-\frac{2 a x^4 \left(c x^n\right)^{-3/n}}{b^3}+\frac{x^4 \left(c x^n\right)^{-2/n}}{2 b^2}+\frac{a^3 x^4 \left(c x^n\right)^{-4/n}}{b^4 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)}+\frac{3 a^2 x^4 \left(c x^n\right)^{-4/n} \text{Log}\left[a+b \left(c x^n\right)^{\frac{1}{n}}\right]}{b^4}$$

Result (type 8, 21 leaves):

$$\int \frac{x^3}{\left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Problem 3007: Unable to integrate problem.

$$\int \frac{x^2}{\left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Optimal (type 3, 90 leaves, 3 steps):

$$\frac{x^3 \left(c x^n\right)^{-2/n}}{b^2}-\frac{a^2 x^3 \left(c x^n\right)^{-3/n}}{b^3 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)}-\frac{2 a x^3 \left(c x^n\right)^{-3/n} \text{Log}\left[a+b \left(c x^n\right)^{\frac{1}{n}}\right]}{b^3}$$

Result (type 8, 21 leaves):

$$\int \frac{x^2}{\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Problem 3008: Unable to integrate problem.

$$\int \frac{x}{\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Optimal (type 3, 67 leaves, 3 steps):

$$\frac{a\,x^2\,\left(c\,x^n\right)^{-2/n}}{b^2\,\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)}+\frac{x^2\,\left(c\,x^n\right)^{-2/n}\,\mathrm{Log}\left[a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right]}{b^2}$$

Result (type 8, 19 leaves):

$$\int \frac{x}{\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Problem 3011: Unable to integrate problem.

$$\int \frac{1}{x^2\,\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Optimal (type 3, 94 leaves, 3 steps):

$$-\frac{1}{a^2\,x}-\frac{b\,\left(c\,x^n\right)^{\frac{1}{n}}}{a^2\,x\,\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)}-\frac{2\,b\,\left(c\,x^n\right)^{\frac{1}{n}}\,\mathrm{Log}[x]}{a^3\,x}+\frac{2\,b\,\left(c\,x^n\right)^{\frac{1}{n}}\,\mathrm{Log}\left[a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right]}{a^3\,x}$$

Result (type 8, 21 leaves):

$$\int \frac{1}{x^2\,\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Problem 3012: Unable to integrate problem.

$$\int \frac{1}{x^3\,\left(a+b\,\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Optimal (type 3, 125 leaves, 3 steps):

$$-\frac{1}{2 a^2 x^2}+\frac{2 b \left(c x^n\right)^{\frac{1}{n}}}{a^3 x^2}+\frac{b^2 \left(c x^n\right)^{2/n}}{a^3 x^2 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)}+\frac{3 b^2 \left(c x^n\right)^{2/n} \text{Log}[x]}{a^4 x^2}-\frac{3 b^2 \left(c x^n\right)^{2/n} \text{Log}\left[a+b \left(c x^n\right)^{\frac{1}{n}}\right]}{a^4 x^2}$$

Result (type 8, 21 leaves):

$$\int \frac{1}{x^3 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Problem 3014: Unable to integrate problem.

$$\int \frac{x}{\left(1+\left(x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Optimal (type 3, 48 leaves, 3 steps):

$$\frac{x^2 \left(x^n\right)^{-2/n}}{1+\left(x^n\right)^{\frac{1}{n}}}+x^2 \left(x^n\right)^{-2/n} \text{Log}\left[1+\left(x^n\right)^{\frac{1}{n}}\right]$$

Result (type 8, 15 leaves):

$$\int \frac{x}{\left(1+\left(x^n\right)^{\frac{1}{n}}\right)^2} \, dx$$

Problem 3024: Unable to integrate problem.

$$\int \frac{1}{a+b \left(c x^n\right)^{2/n}} \, dx$$

Optimal (type 3, 44 leaves, 2 steps):

$$\frac{x \left(c x^n\right)^{-1/n} \text{ArcTan}\left[\frac{\sqrt{b} \left(c x^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right]}{\sqrt{a} \sqrt{b}}$$

Result (type 8, 19 leaves):

$$\int \frac{1}{a+b \left(c x^n\right)^{2/n}} \, dx$$

Problem 3025: Unable to integrate problem.

$$\int \frac{1}{\left(a+b \left(c x^n\right)^{2/n}\right)^2} \, dx$$

Optimal (type 3, 73 leaves, 3 steps):

$$\frac{x}{2\,a\,\left(a+b\,\left(c\,x^n\right)^{2/n}\right)}+\frac{x\,\left(c\,x^n\right)^{-1/n}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\left(c\,x^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right]}{2\,a^{3/2}\,\sqrt{b}}$$

Result (type 8, 19 leaves):

$$\int\frac{1}{\left(a+b\,\left(c\,x^n\right)^{2/n}\right)^2}\,dx$$

Problem 3026: Unable to integrate problem.

$$\int\frac{1}{\left(a+b\,\left(c\,x^n\right)^{2/n}\right)^3}\,dx$$

Optimal (type 3, 98 leaves, 4 steps):

$$\frac{x}{4\,a\,\left(a+b\,\left(c\,x^n\right)^{2/n}\right)^2}+\frac{3\,x}{8\,a^2\,\left(a+b\,\left(c\,x^n\right)^{2/n}\right)}+\frac{3\,x\,\left(c\,x^n\right)^{-1/n}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\left(c\,x^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right]}{8\,a^{5/2}\,\sqrt{b}}$$

Result (type 8, 19 leaves):

$$\int\frac{1}{\left(a+b\,\left(c\,x^n\right)^{2/n}\right)^3}\,dx$$

Problem 3027: Unable to integrate problem.

$$\int\frac{1}{1+4\,\sqrt{x^4}}\,dx$$

Optimal (type 3, 22 leaves, 2 steps):

$$\frac{x\,\text{ArcTan}\left[2\,\left(x^4\right)^{1/4}\right]}{2\,\left(x^4\right)^{1/4}}$$

Result (type 8, 15 leaves):

$$\int\frac{1}{1+4\,\sqrt{x^4}}\,dx$$

Problem 3028: Unable to integrate problem.

$$\int\frac{1}{1-4\,\sqrt{x^4}}\,dx$$

Optimal (type 3, 22 leaves, 2 steps):

$$\frac{x\,\text{ArcTanh}\left[2\left(x^4\right)^{1/4}\right]}{2\left(x^4\right)^{1/4}}$$

Result (type 8, 15 leaves):

$$\int \frac{1}{1-4\sqrt{x^4}}\,dx$$

Problem 3029: Unable to integrate problem.

$$\int \frac{1}{1+4\left(x^6\right)^{1/3}}\,dx$$

Optimal (type 3, 22 leaves, 2 steps):

$$\frac{x\,\text{ArcTan}\left[2\left(x^6\right)^{1/6}\right]}{2\left(x^6\right)^{1/6}}$$

Result (type 9, 142 leaves):

$$\frac{1}{24\left(-x^6\right)^{5/6}}\left(-2\,x\left(-x^{12}\right)^{1/3}\text{Beta}\left[-64\,x^6,\frac{1}{2},0\right]+2\,x\left(x^6\right)^{2/3}\text{Beta}\left[-64\,x^6,\frac{5}{6},0\right]+\left(-x^6\right)^{5/6}\left(-2\,\text{ArcTan}\left[\sqrt{3}-4\,x\right]+4\,\text{ArcTan}[2\,x]+2\,\text{ArcTan}\left[\sqrt{3}+4\,x\right]-\sqrt{3}\,\text{Log}\left[1-2\sqrt{3}\,x+4\,x^2\right]+\sqrt{3}\,\text{Log}\left[1+2\sqrt{3}\,x+4\,x^2\right]\right)\right)$$

Problem 3030: Unable to integrate problem.

$$\int \frac{1}{1-4\left(x^6\right)^{1/3}}\,dx$$

Optimal (type 3, 22 leaves, 2 steps):

$$\frac{x\,\text{ArcTanh}\left[2\left(x^6\right)^{1/6}\right]}{2\left(x^6\right)^{1/6}}$$

Result (type 9, 123 leaves):

$$\frac{1}{24}\left(2\sqrt{3}\,\text{ArcTan}\left[\frac{-1+4\,x}{\sqrt{3}}\right]+2\sqrt{3}\,\text{ArcTan}\left[\frac{1+4\,x}{\sqrt{3}}\right]+\frac{2\,x\,\text{Beta}\left[64\,x^6,\frac{1}{2},0\right]}{\left(x^6\right)^{1/6}}+\frac{2\,x\,\text{Beta}\left[64\,x^6,\frac{5}{6},0\right]}{\left(x^6\right)^{1/6}}-2\,\text{Log}[1-2\,x]+2\,\text{Log}[1+2\,x]-\text{Log}\left[1-2\,x+4\,x^2\right]+\text{Log}\left[1+2\,x+4\,x^2\right]\right)$$

Problem 3031: Unable to integrate problem.

$$\int \frac{1}{1+4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 34 leaves, 2 steps):

$$\frac{1}{2}\,x\left(x^{2n}\right)^{-\frac{1}{2}/n}\,\text{ArcTan}\left[2\left(x^{2n}\right)^{\frac{1}{2}/n}\right]$$

Result (type 8, 17 leaves):

$$\int \frac{1}{1+4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Problem 3032: Unable to integrate problem.

$$\int \frac{1}{1-4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 34 leaves, 2 steps):

$$\frac{1}{2}\,x\left(x^{2n}\right)^{-\frac{1}{2}/n}\,\text{ArcTanh}\left[2\left(x^{2n}\right)^{\frac{1}{2}/n}\right]$$

Result (type 8, 17 leaves):

$$\int \frac{1}{1-4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Problem 3036: Unable to integrate problem.

$$\int \frac{1}{a+b\left(c\,x^n\right)^{3/n}}\,dx$$

Optimal (type 3, 183 leaves, 7 steps):

$$-\frac{x\left(c\,x^n\right)^{-1/n}\,\text{ArcTan}\left[\frac{a^{1/3}-2\,b^{1/3}\left(c\,x^n\right)^{\frac{1}{n}}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{2/3}\,b^{1/3}}+\frac{x\left(c\,x^n\right)^{-1/n}\,\text{Log}\left[a^{1/3}+b^{1/3}\left(c\,x^n\right)^{\frac{1}{n}}\right]}{3\,a^{2/3}\,b^{1/3}}-$$
$$\frac{x\left(c\,x^n\right)^{-1/n}\,\text{Log}\left[a^{2/3}-a^{1/3}\,b^{1/3}\left(c\,x^n\right)^{\frac{1}{n}}+b^{2/3}\left(c\,x^n\right)^{2/n}\right]}{6\,a^{2/3}\,b^{1/3}}$$

Result (type 8, 19 leaves):

$$\int \frac{1}{a+b\left(c\,x^n\right)^{3/n}}\,dx$$

Problem 3037: Unable to integrate problem.

$$\int \frac{1}{\left(a+b\left(c x^n\right)^{3/n}\right)^2}\,dx$$

Optimal (type 3, 210 leaves, 8 steps):

$$\frac{x}{3 a\left(a+b\left(c x^n\right)^{3/n}\right)}-\frac{2 x\left(c x^n\right)^{-1/n} \operatorname{ArcTan}\left[\frac{a^{1/3}-2 b^{1/3}\left(c x^n\right)^{\frac{1}{n}}}{\sqrt{3}\, a^{1/3}}\right]}{3 \sqrt{3}\, a^{5/3} b^{1/3}}+$$
$$\frac{2 x\left(c x^n\right)^{-1/n} \operatorname{Log}\left[a^{1/3}+b^{1/3}\left(c x^n\right)^{\frac{1}{n}}\right]}{9 a^{5/3} b^{1/3}}-\frac{x\left(c x^n\right)^{-1/n} \operatorname{Log}\left[a^{2/3}-a^{1/3} b^{1/3}\left(c x^n\right)^{\frac{1}{n}}+b^{2/3}\left(c x^n\right)^{2/n}\right]}{9 a^{5/3} b^{1/3}}$$

Result (type 8, 19 leaves):

$$\int \frac{1}{\left(a+b\left(c x^n\right)^{3/n}\right)^2}\,dx$$

Problem 3038: Unable to integrate problem.

$$\int \frac{1}{\left(a+b\left(c x^n\right)^{3/n}\right)^3}\,dx$$

Optimal (type 3, 235 leaves, 9 steps):

$$\frac{x}{6 a\left(a+b\left(c x^n\right)^{3/n}\right)^2}+\frac{5 x}{18 a^2\left(a+b\left(c x^n\right)^{3/n}\right)}-\frac{5 x\left(c x^n\right)^{-1/n} \operatorname{ArcTan}\left[\frac{a^{1/3}-2 b^{1/3}\left(c x^n\right)^{\frac{1}{n}}}{\sqrt{3}\, a^{1/3}}\right]}{9 \sqrt{3}\, a^{8/3} b^{1/3}}+$$
$$\frac{5 x\left(c x^n\right)^{-1/n} \operatorname{Log}\left[a^{1/3}+b^{1/3}\left(c x^n\right)^{\frac{1}{n}}\right]}{27 a^{8/3} b^{1/3}}-\frac{5 x\left(c x^n\right)^{-1/n} \operatorname{Log}\left[a^{2/3}-a^{1/3} b^{1/3}\left(c x^n\right)^{\frac{1}{n}}+b^{2/3}\left(c x^n\right)^{2/n}\right]}{54 a^{8/3} b^{1/3}}$$

Result (type 8, 19 leaves):

$$\int \frac{1}{\left(a+b\left(c x^n\right)^{3/n}\right)^3}\,dx$$

Problem 3045: Unable to integrate problem.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}+\frac{c}{x}}}\; x^m\,dx$$

Optimal (type 6, 230 leaves, 4 steps):

$$\left(\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x^{1+m}\,\text{AppellF1}\left[-2\,(1+m),-\frac{1}{2},-\frac{1}{2},\right.\right.$$

$$\left.\left.-1-2\,m,-\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}-\sqrt{-4\,a\,c+b^2\,d}\right)},-\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}+\sqrt{-4\,a\,c+b^2\,d}\right)}\right]\right)\Bigg/$$

$$\left((1+m)\,\sqrt{1+\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}-\sqrt{-4\,a\,c+b^2\,d}\right)}}\,\sqrt{1+\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}+\sqrt{-4\,a\,c+b^2\,d}\right)}}\right)$$

Result (type 8, 28 leaves):

$$\int\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x^m\,dx$$

Problem 3046: Unable to integrate problem.

$$\int\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x^2\,dx$$

Optimal (type 3, 333 leaves, 9 steps):

$$-\frac{3\,b\,d^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{10\,a^2\left(\frac{d}{x}\right)^{5/2}}+\frac{7\,b\,d^2\left(28\,a\,c-15\,b^2\,d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{480\,a^4\left(\frac{d}{x}\right)^{3/2}}+$$

$$\frac{\left(16\,a^2\,c^2-56\,a\,b^2\,c\,d+21\,b^4\,d^2\right)\left(2\,a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x}{256\,a^5}-$$

$$\frac{\left(20\,a\,c-21\,b^2\,d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}x^2}{80\,a^3}+\frac{\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}x^3}{3\,a}+\frac{1}{512\,a^{11/2}}$$

$$\left(4\,a\,c-b^2\,d\right)\left(16\,a^2\,c^2-56\,a\,b^2\,c\,d+21\,b^4\,d^2\right)\text{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]$$

Result (type 8, 28 leaves):

$$\int\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x^2\,dx$$

Problem 3047: Unable to integrate problem.

$$\int\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x\,dx$$

Optimal (type 3, 209 leaves, 7 steps):

$$-\frac{5\,b\,d^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{12\,a^2\left(\frac{d}{x}\right)^{3/2}}-\frac{\left(4\,a\,c-5\,b^2\,d\right)\left(2\,a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x}{32\,a^3}+$$

$$\frac{\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}x^2}{2\,a}-\frac{\left(4\,a\,c-5\,b^2\,d\right)\left(4\,a\,c-b^2\,d\right)\text{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{64\,a^{7/2}}$$

Result (type 8, 26 leaves):

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\; x \, dx$$

Problem 3048: Unable to integrate problem.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\, dx$$

Optimal (type 3, 113 leaves, 5 steps):

$$\frac{\left(2\,a+b\,\sqrt{\frac{d}{x}}\right)\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}\; x}{2\,a}+\frac{\left(4\,a\,c-b^2\,d\right)\,\mathrm{ArcTanh}\left[\frac{2\,a+b\,\sqrt{\frac{d}{x}}}{2\,\sqrt{a}\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{4\,a^{3/2}}$$

Result (type 8, 24 leaves):

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\, dx$$

Problem 3049: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x}\, dx$$

Optimal (type 3, 145 leaves, 8 steps):

$$-2\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}+2\,\sqrt{a}\,\mathrm{ArcTanh}\left[\frac{2\,a+b\,\sqrt{\frac{d}{x}}}{2\,\sqrt{a}\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]-\frac{b\,\sqrt{d}\,\mathrm{ArcTanh}\left[\frac{b\,d+2\,c\,\sqrt{\frac{d}{x}}}{2\,\sqrt{c}\,\sqrt{d}\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{\sqrt{c}}$$

Result (type 8, 28 leaves):

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x}\, dx$$

Problem 3050: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^2}\,dx$$

Optimal (type 3, 155 leaves, 6 steps):

$$\frac{b\left(b\,d+2\,c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{4\,c^2}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{3\,c}+\frac{b\sqrt{d}\,\left(4\,a\,c-b^2\,d\right)\,\text{ArcTanh}\left[\frac{b\,d+2\,c\sqrt{\frac{d}{x}}}{2\sqrt{c}\,\sqrt{d}\,\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{8\,c^{5/2}}$$

Result (type 8, 28 leaves):

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^2}\,dx$$

Problem 3051: Unable to integrate problem.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^3}\,dx$$

Optimal (type 3, 233 leaves, 7 steps):

$$-\frac{b\left(12 a c-7 b^2 d\right)\left(b d+2 c \sqrt{\frac{d}{x}}\right) \sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}{64 c^4}+\frac{\left(32 a c-35 b^2 d+42 b c \sqrt{\frac{d}{x}}\right)\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{120 c^3}-\frac{2\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{5 c x}-\frac{b \sqrt{d}\left(12 a c-7 b^2 d\right)\left(4 a c-b^2 d\right) \text{ArcTanh}\left[\frac{b d+2 c \sqrt{\frac{d}{x}}}{2 \sqrt{c} \sqrt{d} \sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{128 c^{9/2}}$$

Result (type 8, 28 leaves) :

$$\int \frac{\sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^3} \, dx$$

Problem 3052: Unable to integrate problem.

$$\int \frac{\sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^4} \, dx$$

Optimal (type 3, 371 leaves, 9 steps) :

$$\frac{b\left(80 a^2 c^2-120 a b^2 c d+33 b^4 d^2\right)\left(b d+2 c \sqrt{\frac{d}{x}}\right) \sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}{512 c^6}-\frac{1}{6720 c^5}\left(1024 a^2 c^2-3276 a b^2 c d+1155 b^4 d^2+18 b c\left(148 a c-77 b^2 d\right) \sqrt{\frac{d}{x}}\right)\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}+\frac{11 b\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}\left(\frac{d}{x}\right)^{3/2}}{42 c^2 d}-\frac{2\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{7 c x^2}+\frac{\left(32 a c-33 b^2 d\right)\left(a+b \sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{140 c^3 x}+\frac{1}{1024 c^{13/2}} b \sqrt{d}\left(4 a c-b^2 d\right)\left(80 a^2 c^2-120 a b^2 c d+33 b^4 d^2\right) \text{ArcTanh}\left[\frac{b d+2 c \sqrt{\frac{d}{x}}}{2 \sqrt{c} \sqrt{d} \sqrt{a+b \sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]$$

Result (type 8, 28 leaves):

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^4}\,dx$$

Problem 3053: Unable to integrate problem.

$$\int \frac{x^m}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Optimal (type 6, 230 leaves, 4 steps):

$$\left(\sqrt{1+\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}-\sqrt{-4\,a\,c+b^2\,d}\right)}}\,\sqrt{1+\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}+\sqrt{-4\,a\,c+b^2\,d}\right)}}\right.$$

$$x^{1+m}\,\text{AppellF1}\left[-2\,(1+m),\,\frac{1}{2},\,\frac{1}{2},\,-1-2\,m,\,-\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}-\sqrt{-4\,a\,c+b^2\,d}\right)},\right.$$

$$\left.\left.-\frac{2\,c\,\sqrt{\frac{d}{x}}}{\sqrt{d}\,\left(b\,\sqrt{d}+\sqrt{-4\,a\,c+b^2\,d}\right)}\right]\right)\Big/\left((1+m)\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}\right)$$

Result (type 8, 28 leaves):

$$\int \frac{x^m}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Problem 3054: Unable to integrate problem.

$$\int \frac{x^2}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Optimal (type 3, 386 leaves, 10 steps):

$$-\frac{11\,b\,d^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{30\,a^2\left(\frac{d}{x}\right)^{5/2}}+\frac{b\,d^2\left(156\,a\,c-77\,b^2\,d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{160\,a^4\left(\frac{d}{x}\right)^{3/2}}-$$

$$\frac{7\,b\,d\left(528\,a^2\,c^2-680\,a\,b^2\,c\,d+165\,b^4\,d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{1280\,a^6\sqrt{\frac{d}{x}}}+$$

$$\frac{\left(400\,a^2\,c^2-1176\,a\,b^2\,c\,d+385\,b^4\,d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x}{640\,a^5}-$$

$$\frac{\left(100\,a\,c-99\,b^2\,d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x^2}{240\,a^3}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x^3}{3\,a}-\frac{1}{512\,a^{13/2}}$$

$$\left(320\,a^3\,c^3-1680\,a^2\,b^2\,c^2\,d+1260\,a\,b^4\,c\,d^2-231\,b^6\,d^3\right)\text{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]$$

Result (type 8, 28 leaves):

$$\int\frac{x^2}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Problem 3055: Unable to integrate problem.

$$\int\frac{x}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Optimal (type 3, 248 leaves, 8 steps):

$$-\frac{7\,b\,d^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{12\,a^2\left(\frac{d}{x}\right)^{3/2}}+\frac{5\,b\,d\left(44\,a\,c-21\,b^2\,d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{96\,a^4\sqrt{\frac{d}{x}}}-\frac{\left(36\,a\,c-35\,b^2\,d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x}{48\,a^3}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x^2}{2\,a}+\frac{\left(48\,a^2\,c^2-120\,a\,b^2\,c\,d+35\,b^4\,d^2\right)\mathrm{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{64\,a^{9/2}}$$

Result (type 8, 26 leaves):

$$\int\frac{x}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Problem 3056: Unable to integrate problem.

$$\int\frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Optimal (type 3, 135 leaves, 6 steps):

$$-\frac{3\,b\,d\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2\,a^2\sqrt{\frac{d}{x}}}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\;x}{a}-\frac{\left(4\,a\,c-3\,b^2\,d\right)\mathrm{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{4\,a^{5/2}}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Problem 3057: Unable to integrate problem.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}+\frac{c}{x}\,x}}}\,dx$$

Optimal (type 3, 54 leaves, 4 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{2\,a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\,\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{\sqrt{a}}$$

Result (type 8, 28 leaves):

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}+\frac{c}{x}\,x}}}\,dx$$

Problem 3058: Unable to integrate problem.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}+\frac{c}{x}\,x^2}}}\,dx$$

Optimal (type 3, 93 leaves, 5 steps):

$$-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{c}+\frac{b\sqrt{d}\,\text{ArcTanh}\left[\frac{b\,d+2\,c\sqrt{\frac{d}{x}}}{2\sqrt{c}\,\sqrt{d}\,\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{c^{3/2}}$$

Result (type 8, 28 leaves):

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}+\frac{c}{x}\,x^2}}}\,dx$$

Problem 3059: Unable to integrate problem.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\ x^3}\,dx$$

Optimal (type 3, 165 leaves, 6 steps):

$$\frac{\left(16\,a\,c-15\,b^2\,d+10\,b\,c\,\sqrt{\frac{d}{x}}\right)\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}{12\,c^3}-\frac{2\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3\,c\,x}-\frac{b\,\sqrt{d}\,\left(12\,a\,c-5\,b^2\,d\right)\,\text{ArcTanh}\left[\frac{b\,d+2\,c\,\sqrt{\frac{d}{x}}}{2\,\sqrt{c}\,\sqrt{d}\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{8\,c^{7/2}}$$

Result (type 8, 28 leaves):

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\ x^3}\,dx$$

Problem 3060: Unable to integrate problem.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\ x^4}\,dx$$

Optimal (type 3, 289 leaves, 8 steps):

$$-\frac{1}{960\,c^5}\left(1024\,a^2\,c^2-2940\,a\,b^2\,c\,d+945\,b^4\,d^2+14\,b\,c\,\left(92\,a\,c-45\,b^2\,d\right)\,\sqrt{\frac{d}{x}}\right)\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}+$$

$$\frac{9\,b\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}\,\left(\frac{d}{x}\right)^{3/2}}{20\,c^2\,d}-\frac{2\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}{5\,c\,x^2}+\frac{\left(64\,a\,c-63\,b^2\,d\right)\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}{120\,c^3\,x}+$$

$$\frac{b\,\sqrt{d}\,\left(240\,a^2\,c^2-280\,a\,b^2\,c\,d+63\,b^4\,d^2\right)\,\text{ArcTanh}\left[\frac{b\,d+2\,c\,\sqrt{\frac{d}{x}}}{2\,\sqrt{c}\,\sqrt{d}\,\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right]}{128\,c^{11/2}}$$

Result (type 8, 28 leaves) :

$$\int\frac{1}{\sqrt{a+b\,\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x^4}\,dx$$

Problem 3061: Unable to integrate problem.

$$\int\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Optimal (type 2, 26 leaves, 2 steps) :

$$\frac{4\,\left(\sqrt{\frac{1}{x}}+\frac{1}{x}\right)^{3/2}}{3\,\left(\frac{1}{x}\right)^{3/2}}$$

Result (type 8, 17 leaves) :

$$\int\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Problem 3062: Unable to integrate problem.

$$\int\sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Optimal (type 3, 75 leaves, 5 steps) :

$$\frac{1}{4}\left(4+\sqrt{\frac{1}{x}}\right)\sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}\;x+\frac{7\,\text{ArcTanh}\left[\frac{4+\sqrt{\frac{1}{x}}}{2\sqrt{2}\sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}}\right]}{8\sqrt{2}}$$

Result (type 8, 18 leaves):

$$\int\sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Problem 3067: Unable to integrate problem.

$$\int\frac{\left(c\,x^n\right)^{\frac{1}{n}}}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Optimal (type 3, 38 leaves, 4 steps):

$$\frac{x}{b}-\frac{a\,x\left(c\,x^n\right)^{-1/n}\,\text{Log}\left[a+b\left(c\,x^n\right)^{\frac{1}{n}}\right]}{b^2}$$

Result (type 8, 27 leaves):

$$\int\frac{\left(c\,x^n\right)^{\frac{1}{n}}}{a+b\left(c\,x^n\right)^{\frac{1}{n}}}\,dx$$

Problem 3068: Unable to integrate problem.

$$\int\frac{\left(c\,x^n\right)^{\frac{1}{n}}}{\left(a+b\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Optimal (type 3, 63 leaves, 4 steps):

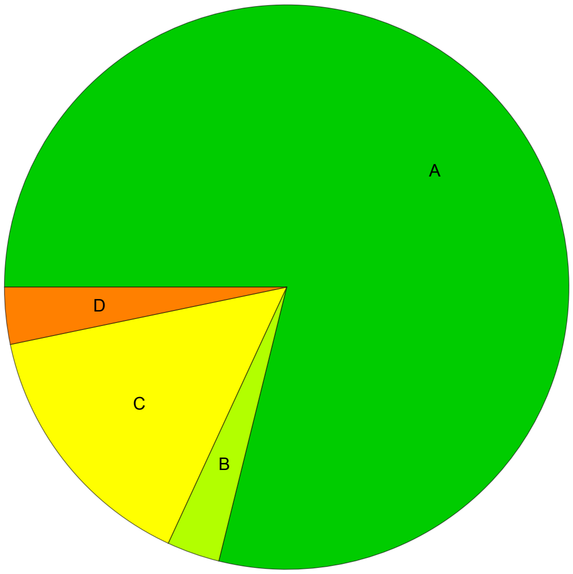
$$\frac{a\,x\left(c\,x^n\right)^{-1/n}}{b^2\left(a+b\left(c\,x^n\right)^{\frac{1}{n}}\right)}+\frac{x\left(c\,x^n\right)^{-1/n}\,\text{Log}\left[a+b\left(c\,x^n\right)^{\frac{1}{n}}\right]}{b^2}$$

Result (type 8, 27 leaves):

$$\int\frac{\left(c\,x^n\right)^{\frac{1}{n}}}{\left(a+b\left(c\,x^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Summary of Integration Test Results

3071 integration problems



A - 2422 optimal antiderivatives

B - 93 more than twice size of optimal antiderivatives

C - 456 unnecessarily complex antiderivatives

D - 100 unable to integrate problems

E - 0 integration timeouts