Mathematica 11.3 Integration Test Results

Test results for the 2590 problems in "1.2.1.2 (d+e x)^m (a+b x+c x^2)^p.m"

Problem 117: Result more than twice size of optimal antiderivative.

$$\int \frac{(d\,x)^m}{\left(b\,x+c\,x^2\right)^3}\,dx$$

Optimal (type 5, 37 leaves, 2 steps):

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

Result (type 5, 123 leaves):

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

Problem 118: Result more than twice size of optimal antiderivative.

$$\int (d\,x)^m\,\left(b\,x+c\,x^2\right)^{5/2}\,dx$$

Optimal (type 5, 73 leaves, 3 steps):

$$\frac{1}{7\,c^3\,x^2}2\,b^2\,\left(-\frac{c\,x}{b}\right)^{-\frac{1}{2}-m}\,(d\,x)^m\,(b+c\,x)\,\left(b\,x+c\,x^2\right)^{5/2}\,\text{Hypergeometric2F1}\left[\frac{7}{2},\,-\frac{5}{2}-m,\,\frac{9}{2},\,1+\frac{c\,x}{b}\right]$$

Result (type 5, 157 leaves):

$$\left(2\,x^3\,(d\,x)^m\,\sqrt{x\,(b+c\,x)}\,\left(b^2\,\left(99+40\,m+4\,m^2\right)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{7}{2}+m,\,\frac{9}{2}+m,\,-\frac{c\,x}{b}\right]+c\,(7+2\,m)\,x\,\left(2\,b\,(11+2\,m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{9}{2}+m,\,\frac{11}{2}+m,\,-\frac{c\,x}{b}\right]+c\,(9+2\,m)\,x\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{11}{2}+m,\,\frac{13}{2}+m,\,-\frac{c\,x}{b}\right]\right)\right)\right)\Big/\left((7+2\,m)\,(9+2\,m)\,(11+2\,m)\,\sqrt{1+\frac{c\,x}{b}}\right)$$

Problem 175: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^{5/2}}{x^7}\,dx$$

Optimal (type 2, 37 leaves, 2 steps):

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

Result (type 2, 75 leaves):

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

Problem 311: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 36 leaves, 3 steps):

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

Result (type 3, 73 leaves):

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

Problem 312: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 18 leaves, 2 steps):

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

Result (type 3, 59 leaves):

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

Problem 313: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 36 leaves, 3 steps):

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

Result (type 3, 74 leaves):

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

Problem 386: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 362 leaves, 9 steps):

$$\frac{1}{105\,c^2\,e}2\sqrt{d+e\,x}\,\left(3\,c^2\,d^2+9\,b\,c\,d\,e-4\,b^2\,e^2+12\,c\,e\,(2\,c\,d-b\,e)\,x\right)\sqrt{b\,x+c\,x^2}+\frac{2\,e\sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{3/2}}{7\,c}-$$
$$\left(2\sqrt{-b}\,(2\,c\,d-b\,e)\,\left(3\,c^2\,d^2-3\,b\,c\,d\,e+8\,b^2\,e^2\right)\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(105\,c^{5/2}\,e^2\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$
$$\left(4\sqrt{-b}\,d\,(c\,d-b\,e)\,\left(3\,c^2\,d^2-3\,b\,c\,d\,e+2\,b^2\,e^2\right)\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(105\,c^{5/2}\,e^2\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 372 leaves):

$$\frac{1}{105\, b\, c^2\, e^2 \sqrt{x\, (b + c\, x)}\, \sqrt{d + e\, x}} \left(2 \left(b\, e\, x\, (b + c\, x)\, (d + e\, x)\, \left(-4\, b^2\, e^2 + 3\, b\, c\, e\, (3\, d + e\, x) + 3\, c^2\, \left(d^2 + 8\, d\, e\, x + 5\, e^2\, x^2\right)\right) - \sqrt{\frac{b}{c}} \left(\sqrt{\frac{b}{c}}\, \left(6\, c^3\, d^3 - 9\, b\, c^2\, d^2\, e + 19\, b^2\, c\, d\, e^2 - 8\, b^3\, e^3\right)\, (b + c\, x)\, (d + e\, x) + i\, b\, e\, \left(6\, c^3\, d^3 - 9\, b\, c^2\, d^2\, e + 19\, b^2\, c\, d\, e^2 - 8\, b^3\, e^3\right) \sqrt{1 + \frac{b}{c\, x}}\, \sqrt{1 + \frac{d}{e\, x}}\, x^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c\, d}{b\, e}\right] - i\, b\, e\, \left(3\, c^3\, d^3 - 18\, b\, c^2\, d^2\, e + 23\, b^2\, c\, d\, e^2 - 8\, b^3\, e^3\right) \sqrt{1 + \frac{b}{c\, x}}\, \sqrt{1 + \frac{d}{e\, x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c\, d}{b\, e}\right]\right)\right)\right)$$

Problem 387: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{d + e\, x}\, \sqrt{b\, x + c\, x^2}\, dx$$

Optimal (type 4, 308 leaves, 9 steps):

$$-\frac{2\, (2\, c\, d - b\, e)\, \sqrt{d + e\, x}\, \sqrt{b\, x + c\, x^2}}{15\, c\, e} + \frac{2\, (d + e\, x)^{3/2}\, \sqrt{b\, x + c\, x^2}}{5\, e} - \left(4\, \sqrt{-b}\, \left(c^2\, d^2 - b\, c\, d\, e + b^2\, e^2\right)\, \sqrt{x}\, \sqrt{1 + \frac{c\, x}{b}}\, \sqrt{d + e\, x}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\, \sqrt{x}}{\sqrt{-b}}\right], \frac{b\, e}{c\, d}\right]\right) \Big/ \left(15\, c^{3/2}\, e^2\, \sqrt{1 + \frac{e\, x}{d}}\, \sqrt{b\, x + c\, x^2}\right) + \left(2\, \sqrt{-b}\, d\, (c\, d - b\, e)\, (2\, c\, d - b\, e)\, \sqrt{x}\, \sqrt{1 + \frac{c\, x}{b}}\, \sqrt{1 + \frac{e\, x}{d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\, \sqrt{x}}{\sqrt{-b}}\right], \frac{b\, e}{c\, d}\right]\right) \Big/ \left(15\, c^{3/2}\, e^2\, \sqrt{d + e\, x}\, \sqrt{b\, x + c\, x^2}\right)$$

Result (type 4, 294 leaves):

$$\left(2\left(b\,e\,x\,(b+c\,x)\,(d+e\,x)\,(b\,e+c\,(d+3\,e\,x))+\sqrt{\frac{b}{c}}\left(-2\sqrt{\frac{b}{c}}\left(c^2 d^2-b\,c\,d\,e+b^2 e^2\right)(b+c\,x)\,(d+e\,x)-2\,\mathrm{i}\,b\,e\left(c^2 d^2-b\,c\,d\,e+b^2 e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+\mathrm{i}\,b\,e\left(c^2 d^2-3\,b\,c\,d\,e+2\,b^2 e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)\right)\Big/\left(15\,b\,c\,e^2\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}\right)$$

Problem 388: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x+c\,x^2}}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 246 leaves, 8 steps):

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

Result (type 4, 226 leaves):

$$\left(2\left((b+c x)(d+e x)(-2 c d+b e+c e x)+\right.\right.$$

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

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

$$\left(3 c e^2\sqrt{x(b+c x)}\sqrt{d+e x}\right)$$

Problem 389: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 231 leaves, 8 steps):

$$-\frac{2\sqrt{b x+c x^2}}{e\sqrt{d+e x}}+\frac{4\sqrt{-b}\sqrt{c}\sqrt{x}\sqrt{1+\frac{c x}{b}}\sqrt{d+e x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]}{e^2\sqrt{1+\frac{e x}{d}}\sqrt{b x+c x^2}}-$$

$$\left(2\sqrt{-b}(2 c d-b e)\sqrt{x}\sqrt{1+\frac{c x}{b}}\sqrt{1+\frac{e x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right)\Big/$$

$$\left(\sqrt{c}\, e^2\sqrt{d+e x}\sqrt{b x+c x^2}\right)$$

Result (type 4, 195 leaves):

$$\left(2\left(\sqrt{\frac{b}{c}}\,(b+c\,x)\,(2\,d+e\,x)+2\,i\,b\,e\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-\right.\right.$$

$$\left.\left.i\,b\,e\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)\Big/$$

$$\left(\sqrt{\frac{b}{c}}\,e^2\,\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}\right)$$

Problem 390: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x+c\,x^2}}{(d+e\,x)^{5/2}}\,dx$$

Optimal (type 4, 301 leaves, 9 steps):

$$-\frac{2\,\sqrt{b\,x+c\,x^2}}{3\,e\,(d+e\,x)^{3/2}}+\frac{2\,(2\,c\,d-b\,e)\,\sqrt{b\,x+c\,x^2}}{3\,d\,e\,(c\,d-b\,e)\,\sqrt{d+e\,x}}-$$

$$\left(2\,\sqrt{-b}\,\sqrt{c}\,(2\,c\,d-b\,e)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/$$

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

$$\frac{4\,\sqrt{-b}\,\sqrt{c}\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]}{3\,e^2\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}}$$

Result (type 4, 265 leaves):

$$-\left(\left(2\left(e\,x\,(b+c\,x)\left(b\,e^2\,x-c\,d\,(d+2\,e\,x)\right)+(d+e\,x)\left((2\,c\,d-b\,e)\,(b+c\,x)\,(d+e\,x)-\right.\right.\right.\right.$$

$$i\sqrt{\frac{b}{c}}\;c\,e\,(-2\,c\,d+b\,e)\sqrt{1+\frac{b}{c\,x}}\sqrt{1+\frac{d}{e\,x}}\;x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+$$

$$\left.\left.\left.\left.i\sqrt{\frac{b}{c}}\;c\,e\,(-c\,d+b\,e)\sqrt{1+\frac{b}{c\,x}}\sqrt{1+\frac{d}{e\,x}}\;x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)\right)\right/$$

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

Problem 391: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 398 leaves, 10 steps):

$$-\frac{2\sqrt{b\,x+c\,x^2}}{5\,e\,(d+e\,x)^{5/2}}+\frac{2\,(2\,c\,d-b\,e)\sqrt{b\,x+c\,x^2}}{15\,d\,e\,(c\,d-b\,e)\,(d+e\,x)^{3/2}}+\frac{4\,(c^2\,d^2-b\,c\,d\,e+b^2\,e^2)\sqrt{b\,x+c\,x^2}}{15\,d^2\,e\,(c\,d-b\,e)^2\sqrt{d+e\,x}}-$$

$$\left(4\sqrt{-b}\,\sqrt{c}\,(c^2\,d^2-b\,c\,d\,e+b^2\,e^2)\sqrt{x}\sqrt{1+\frac{c\,x}{b}}\sqrt{d+e\,x}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/$$

$$\left(15\,d^2\,e^2\,(c\,d-b\,e)^2\sqrt{1+\frac{e\,x}{d}}\sqrt{b\,x+c\,x^2}\right)+$$

$$\left(2\sqrt{-b}\,\sqrt{c}\,(2\,c\,d-b\,e)\sqrt{x}\sqrt{1+\frac{c\,x}{b}}\sqrt{1+\frac{e\,x}{d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/$$

$$\left(15\,d\,e^2\,(c\,d-b\,e)\sqrt{d+e\,x}\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 362 leaves):

$$-\frac{1}{15\,b\,d^2\,e^2\,(c\,d-b\,e)^2\,\sqrt{x\,(b+c\,x)}\,(d+e\,x)^{5/2}}\,2\left(b\,e\,x\,(b+c\,x)\,\left(-b^2\,e^3\,x\,(5\,d+2\,e\,x)-c^2\,d^2\,\left(d^2+6\,d\,e\,x+2\,e^2\,x^2\right)+b\,c\,d\,e\,\left(-d^2+7\,d\,e\,x+2\,e^2\,x^2\right)\right)+\sqrt{\frac{b}{c}}\,c\,(d+e\,x)^2\left(2\,\sqrt{\frac{b}{c}}\,\left(c^2\,d^2-b\,c\,d\,e+b^2\,e^2\right)\,(b+c\,x)\,(d+e\,x)+2\,\mathrm{i}\,b\,e\,\left(c^2\,d^2-b\,c\,d\,e+b^2\,e^2\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-\mathrm{i}\,b\,e\,\left(c^2\,d^2-3\,b\,c\,d\,e+2\,b^2\,e^2\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 392: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 521 leaves, 10 steps):

$$\frac{1}{1155\,c^3\,e^3}2\,\sqrt{d+e\,x}\,\left(8\,c^4\,d^4-19\,b\,c^3\,d^3\,e+6\,b^2\,c^2\,d^2\,e^2-19\,b^3\,c\,d\,e^3+8\,b^4\,e^4-3\,c\,e\,\left(2\,c\,d-b\,e\right)\,\left(c^2\,d^2-b\,c\,d\,e+8\,b^2\,e^2\right)\,x\right)\,\sqrt{b\,x+c\,x^2}+\frac{1}{231\,c^2\,e}2\,\sqrt{d+e\,x}\,\left(c^2\,d^2+13\,b\,c\,d\,e-6\,b^2\,e^2+14\,c\,e\,\left(2\,c\,d-b\,e\right)\,x\right)\,\left(b\,x+c\,x^2\right)^{3/2}+\frac{2\,e\,\sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{5/2}}{11\,c}-\left(16\,\sqrt{-b}\,\left(c\,d-2\,b\,e\right)\,\left(2\,c\,d-b\,e\right)\,\left(c\,d+b\,e\right)\,\left(c^2\,d^2-b\,c\,d\,e+b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(1155\,c^{7/2}\,e^4\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+\left(2\,\sqrt{-b}\,d\,\left(c\,d-b\,e\right)\,\left(16\,c^4\,d^4-32\,b\,c^3\,d^3\,e+3\,b^2\,c^2\,d^2\,e^2+13\,b^3\,c\,d\,e^3-8\,b^4\,e^4\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(1155\,c^{7/2}\,e^4\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 559 leaves) :

$$\frac{1}{1155\,b\,c^3\,e^4\,x^2\,\left(b+c\,x\right)^2\,\sqrt{d+e\,x}}2\,\left(x\,\left(b+c\,x\right)\right)^{3/2}\left(b\,e\,x\,\left(b+c\,x\right)\,\left(d+e\,x\right)\,\left(8\,b^4\,e^4-b^3\,c\,e^3\,\left(19\,d+6\,e\,x\right)+b^2\,c^2\,e^2\,\left(6\,d^2+14\,d\,e\,x+5\,e^2\,x^2\right)+b\,c^3\,e\,\left(-19\,d^3+14\,d^2\,e\,x+205\,d\,e^2\,x^2+140\,e^3\,x^3\right)+c^4\,\left(8\,d^4-6\,d^3\,e\,x+5\,d^2\,e^2\,x^2+140\,d\,e^3\,x^3+105\,e^4\,x^4\right)\right)+\sqrt{\frac{b}{c}}\left(-8\,\sqrt{\frac{b}{c}}\,\left(2\,c^5\,d^5-5\,b\,c^4\,d^4\,e+2\,b^2\,c^3\,d^3\,e^2+2\,b^3\,c^2\,d^2\,e^3-5\,b^4\,c\,d\,e^4+2\,b^5\,e^5\right)\,\left(b+c\,x\right)\,\left(d+e\,x\right)-8\,i\,b\,e\,\left(2\,c^5\,d^5-5\,b\,c^4\,d^4\,e+2\,b^2\,c^3\,d^3\,e^2+2\,b^3\,c^2\,d^2\,e^3-5\,b^4\,c\,d\,e^4+2\,b^5\,e^5\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+i\,b\,e\,\left(8\,c^5\,d^5-21\,b\,c^4\,d^4\,e+10\,b^2\,c^3\,d^3\,e^2+35\,b^3\,c^2\,d^2\,e^3-48\,b^4\,c\,d\,e^4+16\,b^5\,e^5\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 393: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{3/2}\,dx$$

Optimal (type 4, 457 leaves, 10 steps):

$$\frac{1}{315\,c^2\,e^3}2\,\sqrt{d+e\,x}\,\left(8\,c^3\,d^3-15\,b\,c^2\,d^2\,e+3\,b^2\,c\,d\,e^2-4\,b^3\,e^3-6\,c\,e\,\left(c^2\,d^2-b\,c\,d\,e+2\,b^2\,e^2\right)\,x\right)\,\sqrt{b\,x+c\,x^2}-\frac{2\,\left(2\,c\,d-b\,e\right)\,\sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{3/2}}{21\,c\,e}+\frac{2\,\left(d+e\,x\right)^{3/2}\,\left(b\,x+c\,x^2\right)^{3/2}}{9\,e}-\left(2\,\sqrt{-b}\,\left(16\,c^4\,d^4-32\,b\,c^3\,d^3\,e+9\,b^2\,c^2\,d^2\,e^2+7\,b^3\,c\,d\,e^3-8\,b^4\,e^4\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(315\,c^{5/2}\,e^4\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+\left(8\,\sqrt{-b}\,d\,\left(c\,d-b\,e\right)\,\left(2\,c\,d-b\,e\right)\,\left(2\,c^2\,d^2-2\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(315\,c^{5/2}\,e^4\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 463 leaves):

$$\frac{1}{315\, b\, c^2\, e^4\, x^2\, (b+c\,x)^2\, \sqrt{d+e\,x}} \left(2\,(x\,(b+c\,x))^{3/2} \left(b\,e\,x\,(b+c\,x)\,(d+e\,x)\,\left(-4\,b^3\,e^3+3\,b^2\,c\,e^2\,(d+e\,x)+\right.\right.\right.$$

$$\left. b\,c^2\,e\,\left(-15\,d^2+11\,d\,e\,x+50\,e^2\,x^2\right)+c^3\,\left(8\,d^3-6\,d^2\,e\,x+5\,d\,e^2\,x^2+35\,e^3\,x^3\right)\right)-$$

$$\sqrt{\frac{b}{c}} \left(\sqrt{\frac{b}{c}}\,\left(16\,c^4\,d^4-32\,b\,c^3\,d^3\,e+9\,b^2\,c^2\,d^2\,e^2+7\,b^3\,c\,d\,e^3-8\,b^4\,e^4\right)\,(b+c\,x)\,(d+e\,x)+\right.$$

$$i\,b\,e\,\left(16\,c^4\,d^4-32\,b\,c^3\,d^3\,e+9\,b^2\,c^2\,d^2\,e^2+7\,b^3\,c\,d\,e^3-8\,b^4\,e^4\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}$$

$$x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e\,\left(8\,c^4\,d^4-17\,b\,c^3\,d^3\,e+6\,b^2\,c^2\,d^2\,e^2+\right.$$

$$\left.\left.\left. 11\,b^3\,c\,d\,e^3-8\,b^4\,e^4\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 394: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 360 leaves, 9 steps):

$$\frac{2\,\sqrt{d+e\,x}\,\left(8\,c^2\,d^2-11\,b\,c\,d\,e+b^2\,e^2-3\,c\,e\,(2\,c\,d-b\,e)\,x\right)\,\sqrt{b\,x+c\,x^2}}{35\,c\,e^3}+$$

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

$$\left.\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(35\,c^{3/2}\,e^4\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$

$$\left(2\,\sqrt{-b}\,d\,(c\,d-b\,e)\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(35\,c^{3/2}\,e^4\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 380 leaves):

$$\frac{1}{35\, b\, c\, e^4\, x^2\, (b+c\, x)^2\, \sqrt{d+e\, x}} 2\, (x\, (b+c\, x))^{3/2} \left(b\, e\, x\, (b+c\, x)\, (d+e\, x)\, \left(b^2\, e^2+b\, c\, e\, (-11\, d+8\, e\, x)+c^2\, \left(8\, d^2-6\, d\, e\, x+5\, e^2\, x^2\right)\right)+\right.$$
$$\sqrt{\frac{b}{c}} \left(-2\, \sqrt{\frac{b}{c}}\, \left(8\, c^3\, d^3-12\, b\, c^2\, d^2\, e+2\, b^2\, c\, d\, e^2+b^3\, e^3\right)\, (b+c\, x)\, (d+e\, x)-\right.$$
$$2\, i\, b\, e\, \left(8\, c^3\, d^3-12\, b\, c^2\, d^2\, e+2\, b^2\, c\, d\, e^2+b^3\, e^3\right)\, \sqrt{1+\frac{b}{c\, x}}\, \sqrt{1+\frac{d}{e\, x}}\, x^{3/2}$$
$$\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\, \frac{c\, d}{b\, e}\right]+i\, b\, e\, \left(8\, c^3\, d^3-13\, b\, c^2\, d^2\, e+3\, b^2\, c\, d\, e^2+2\, b^3\, e^3\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\, x}}\, \sqrt{1+\frac{d}{e\, x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\, \frac{c\, d}{b\, e}\right]\right)\right)$$

Problem 395: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 309 leaves, 9 steps):

$$-\frac{2\, \sqrt{d+e\, x}\, (8\, c\, d-7\, b\, e-6\, c\, e\, x)\, \sqrt{b\, x+c\, x^2}}{5\, e^3}-\frac{2\, \left(b\, x+c\, x^2\right)^{3/2}}{e\, \sqrt{d+e\, x}}+$$
$$\left(2\, \sqrt{-b}\, \left(16\, c^2\, d^2-16\, b\, c\, d\, e+b^2\, e^2\right)\, \sqrt{x}\, \sqrt{1+\frac{c\, x}{b}}\, \sqrt{d+e\, x}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\, \sqrt{x}}{\sqrt{-b}}\right],\, \frac{b\, e}{c\, d}\right]\right)\Big/$$
$$\left(5\, \sqrt{c}\, e^4\, \sqrt{1+\frac{e\, x}{d}}\, \sqrt{b\, x+c\, x^2}\right)-$$
$$\left(16\, \sqrt{-b}\, d\, (c\, d-b\, e)\, (2\, c\, d-b\, e)\, \sqrt{x}\, \sqrt{1+\frac{c\, x}{b}}\, \sqrt{1+\frac{e\, x}{d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\, \sqrt{x}}{\sqrt{-b}}\right],\, \frac{b\, e}{c\, d}\right]\right)\Big/$$
$$\left(5\, \sqrt{c}\, e^4\, \sqrt{d+e\, x}\, \sqrt{b\, x+c\, x^2}\right)$$

Result (type 4, 340 leaves) :

$$\frac{1}{5\,c\,e^4\,\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}}\left(2\left(b^3\,e^2\,(d+e\,x)+b^2\,c\,e\,\left(-16\,d^2-8\,d\,e\,x+3\,e^2\,x^2\right)+c^3\,x\,\left(16\,d^3+8\,d^2\,e\,x-2\,d\,e^2\,x^2+e^3\,x^3\right)+b\,c^2\,\left(16\,d^3-8\,d^2\,e\,x-11\,d\,e^2\,x^2+3\,e^3\,x^3\right)\right)+2\,i\,\sqrt{\frac{b}{c}}\,c\,e\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-2\,i\,\sqrt{\frac{b}{c}}\,c\,e\left(8\,c^2\,d^2-9\,b\,c\,d\,e+b^2\,e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)$$

Problem 396: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 298 leaves, 9 steps) :

$$\frac{2\,(8\,c\,d-3\,b\,e+2\,c\,e\,x)\,\sqrt{b\,x+c\,x^2}}{3\,e^3\,\sqrt{d+e\,x}}-\frac{2\,\left(b\,x+c\,x^2\right)^{3/2}}{3\,e\,(d+e\,x)^{3/2}}-\left(16\,\sqrt{-b}\,\sqrt{c}\,(2\,c\,d-b\,e)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Bigg/\left(3\,e^4\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+\left(2\,\sqrt{-b}\,(4\,c\,d-3\,b\,e)\,(4\,c\,d-b\,e)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Bigg/\left(3\,\sqrt{c}\,e^4\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 279 leaves) :

$$\left(2 \left(x (b+c x)\right)^{3/2} \left(8 (-2 c d+b e) (b+c x) (d+e x)+\frac{e x (b+c x) \left(-b e (3 d+4 e x)+c \left(8 d^2+10 d e x+e^2 x^2\right)\right)}{d+e x}+8 i \sqrt{\frac{b}{c}}\, c e (-2 c d+b e) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]-i \sqrt{\frac{b}{c}}\, c e (-8 c d+5 b e) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)\right) \Big/ \left(3 e^4 x^2 (b+c x)^2 \sqrt{d+e x}\right)$$

Problem 397: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 354 leaves, 9 steps):

$$-\frac{2 \left(c d^2 (8 c d-7 b e)+e \left(10 c^2 d^2-10 b c d e+b^2 e^2\right) x\right) \sqrt{b x+c x^2}}{5 d e^3 (c d-b e) (d+e x)^{3/2}}-\frac{2 \left(b x+c x^2\right)^{3/2}}{5 e (d+e x)^{5/2}}+\left(2 \sqrt{-b} \sqrt{c} \left(16 c^2 d^2-16 b c d e+b^2 e^2\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{d+e x}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Big/ \left(5 d e^4 (c d-b e) \sqrt{1+\frac{e x}{d}} \sqrt{b x+c x^2}\right)-\left(16 \sqrt{-b} \sqrt{c} (2 c d-b e) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{1+\frac{e x}{d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Big/ \left(5 e^4 \sqrt{d+e x} \sqrt{b x+c x^2}\right)$$

Result (type 4, 369 leaves):

$$-\frac{1}{5\,b\,d\,e^4\,(c\,d-b\,e)\,x^2\,(b+c\,x)^2\,(d+e\,x)^{5/2}}\,2\,\left(x\,(b+c\,x)\right)^{3/2}\left(b\,e\,x\,(b+c\,x)\,\left(b^2\,e^4\,x^2-b\,c\,d\,e\,\left(7\,d^2+16\,d\,e\,x+11\,e^2\,x^2\right)+c^2\,d^2\,\left(8\,d^2+18\,d\,e\,x+11\,e^2\,x^2\right)\right)-\right.$$

$$\sqrt{\frac{b}{c}}\,c\,(d+e\,x)^2\left(\sqrt{\frac{b}{c}}\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2\right)\,(b+c\,x)\,(d+e\,x)+i\,b\,e\,\left(16\,c^2\,d^2-\right.\right.$$

$$\left.16\,b\,c\,d\,e+b^2\,e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e$$

$$\left.\left.\left(8\,c^2\,d^2-9\,b\,c\,d\,e+b^2\,e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 398: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x+c\,x^2\right)^{3/2}}{(d+e\,x)^{9/2}}\,dx$$

Optimal (type 4, 476 leaves, 10 steps):

$$\frac{4\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{b\,x+c\,x^2}}{35\,d^2\,e^3\,(c\,d-b\,e)^2\,\sqrt{d+e\,x}}-$$
$$\left(2\,\left(d\,\left(8\,c^2\,d^2-5\,b\,c\,d\,e-2\,b^2\,e^2\right)+e\,\left(14\,c^2\,d^2-14\,b\,c\,d\,e+b^2\,e^2\right)\,x\right)\,\sqrt{b\,x+c\,x^2}\right)\bigg/$$
$$\left(35\,d\,e^3\,(c\,d-b\,e)\,(d+e\,x)^{5/2}\right)-\frac{2\,\left(b\,x+c\,x^2\right)^{3/2}}{7\,e\,(d+e\,x)^{7/2}}-$$
$$\left(4\,\sqrt{-b}\,\sqrt{c}\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\bigg/\left(35\,d^2\,e^4\,(c\,d-b\,e)^2\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$
$$\left(2\,\sqrt{-b}\,\sqrt{c}\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\bigg/\left(35\,d\,e^4\,(c\,d-b\,e)\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 479 leaves) :

$$-\frac{1}{35\, b\, d^2\, e^4\, (c\, d-b\, e)^2\, x^2\, (b+c\, x)^2\, (d+e\, x)^{7/2}}$$
$$2\, (x\, (b+c\, x))^{3/2} \left(b\, e\, x\, (b+c\, x)\, \left(5\, d^3\, (c\, d-b\, e)^3-8\, d^2\, (c\, d-b\, e)^2\, (2\, c\, d-b\, e)\, (d+e\, x)+\right.\right.$$
$$\left. d\, (c\, d-b\, e)\, \left(19\, c^2\, d^2-19\, b\, c\, d\, e+b^2\, e^2\right)\, (d+e\, x)^2-2\, \left(8\, c^3\, d^3-12\, b\, c^2\, d^2\, e+2\, b^2\, c\, d\, e^2+b^3\, e^3\right)\, (d+e\, x)^3\right)+$$
$$\sqrt{\frac{b}{c}}\, c\, (d+e\, x)^3 \left(2\, \sqrt{\frac{b}{c}}\, \left(8\, c^3\, d^3-12\, b\, c^2\, d^2\, e+2\, b^2\, c\, d\, e^2+b^3\, e^3\right)\, (b+c\, x)\, (d+e\, x)+\right.$$
$$2\, i\, b\, e\, \left(8\, c^3\, d^3-12\, b\, c^2\, d^2\, e+2\, b^2\, c\, d\, e^2+b^3\, e^3\right)\, \sqrt{1+\frac{b}{c\, x}}\, \sqrt{1+\frac{d}{e\, x}}\, x^{3/2}$$
$$\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c\, d}{b\, e}\right]-i\, b\, e\, \left(8\, c^3\, d^3-13\, b\, c^2\, d^2\, e+3\, b^2\, c\, d\, e^2+2\, b^3\, e^3\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\, x}}\, \sqrt{1+\frac{d}{e\, x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c\, d}{b\, e}\right]\right)\right)$$

Problem 399: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{d+e\, x}\, \left(b\, x+c\, x^2\right)^{5/2} dx$$

Optimal (type 4, 666 leaves, 11 steps):

$$\frac{1}{9009\, c^3\, e^5} 2 \sqrt{d+e\,x} \left(128\, c^5\, d^5 - 368\, b\, c^4\, d^4\, e + 303\, b^2\, c^3\, d^3\, e^2 - 22\, b^3\, c^2\, d^2\, e^3 - 17\, b^4\, c\, d\, e^4 + 24\, b^5\, e^5 - 3\, c\, e \left(32\, c^4\, d^4 - 64\, b\, c^3\, d^3\, e + 21\, b^2\, c^2\, d^2\, e^2 + 11\, b^3\, c\, d\, e^3 - 24\, b^4\, e^4\right) x\right) \sqrt{b\,x+c\,x^2} + \frac{1}{9009\, c^2\, e^3} 10 \sqrt{d+e\,x} \left(16\, c^3\, d^3 - 31\, b\, c^2\, d^2\, e + 9\, b^2\, c\, d\, e^2 - 18\, b^3\, e^3 - 14\, c\, e \left(c^2\, d^2 - b\, c\, d\, e + 3\, b^2\, e^2\right) x\right) \left(b\,x+c\,x^2\right)^{3/2} - \frac{10 \left(2\, c\, d - b\, e\right) \sqrt{d+e\,x} \left(b\,x+c\,x^2\right)^{5/2}}{143\, c\, e} + \frac{2 \left(d+e\,x\right)^{3/2} \left(b\,x+c\,x^2\right)^{5/2}}{13\, e} - \left(4 \sqrt{-b} \left(128\, c^6\, d^6 - 384\, b\, c^5\, d^5\, e + 343\, b^2\, c^4\, d^4\, e^2 - 46\, b^3\, c^3\, d^3\, e^3 - 21\, b^4\, c^2\, d^2\, e^4 - 20\, b^5\, c\, d\, e^5 + 24\, b^6\, e^6\right) \sqrt{x} \sqrt{1+\frac{c\,x}{b}} \sqrt{d+e\,x}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right], \frac{b\,e}{c\,d}\right]\right) \Big/ \left(9009\, c^{7/2}\, e^6 \sqrt{1+\frac{e\,x}{d}} \sqrt{b\,x+c\,x^2}\right) + \left(2 \sqrt{-b}\, d \left(c\, d - b\, e\right) \left(2\, c\, d - b\, e\right) \left(128\, c^4\, d^4 - 256\, b\, c^3\, d^3\, e + 79\, b^2\, c^2\, d^2\, e^2 + 49\, b^3\, c\, d\, e^3 + 24\, b^4\, e^4\right) \sqrt{x} \sqrt{1+\frac{c\,x}{b}} \sqrt{1+\frac{e\,x}{d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right], \frac{b\,e}{c\,d}\right]\right) \Big/ \left(9009\, c^{7/2}\, e^6 \sqrt{d+e\,x} \sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 663 leaves):

$$\frac{1}{9009\,b\,c^3\,e^6\,x^3\,(b+c\,x)^3\,\sqrt{d+e\,x}}\left(2\,(x\,(b+c\,x))^{5/2}\left(b\,e\,x\,(b+c\,x)\,(d+e\,x)\,\left(24\,b^5\,e^5-b^4\,c\,e^4\,(17\,d+18\,e\,x)+b^3\,c^2\,e^3\,\left(-22\,d^2+12\,d\,e\,x+15\,e^2\,x^2\right)+b^2\,c^3\,e^2\,\left(303\,d^3-218\,d^2\,e\,x+178\,d\,e^2\,x^2+1113\,e^3\,x^3\right)+b\,c^4\,e\,\left(-368\,d^4+272\,d^3\,e\,x-225\,d^2\,e^2\,x^2+196\,d\,e^3\,x^3+1701\,e^4\,x^4\right)+c^5\,\left(128\,d^5-96\,d^4\,e\,x+80\,d^3\,e^2\,x^2-70\,d^2\,e^3\,x^3+63\,d\,e^4\,x^4+693\,e^5\,x^5\right)\right)+\sqrt{\frac{b}{c}}\left(-2\,\sqrt{\frac{b}{c}}\,\left(128\,c^6\,d^6-384\,b\,c^5\,d^5\,e+343\,b^2\,c^4\,d^4\,e^2-46\,b^3\,c^3\,d^3\,e^3-21\,b^4\,c^2\,d^2\,e^4-20\,b^5\,c\,d\,e^5+24\,b^6\,e^6\right)\,(b+c\,x)\,(d+e\,x)-2\,i\,b\,e\,\left(128\,c^6\,d^6-384\,b\,c^5\,d^5\,e+343\,b^2\,c^4\,d^4\,e^2-46\,b^3\,c^3\,d^3\,e^3-21\,b^4\,c^2\,d^2\,e^4-20\,b^5\,c\,d\,e^5+24\,b^6\,e^6\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+i\,b\,e\,\left(128\,c^6\,d^6-400\,b\,c^5\,d^5\,e+383\,b^2\,c^4\,d^4\,e^2-70\,b^3\,c^3\,d^3\,e^3-25\,b^4\,c^2\,d^2\,e^4-64\,b^5\,c\,d\,e^5+48\,b^6\,e^6\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 400: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x+c\,x^2\right)^{5/2}}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 537 leaves, 10 steps):

$$\frac{1}{693\,c^2\,e^5}2\,\sqrt{d+e\,x}\,\left(128\,c^4\,d^4-304\,b\,c^3\,d^3\,e+195\,b^2\,c^2\,d^2\,e^2-7\,b^3\,c\,d\,e^3-4\,b^4\,e^4-12\,c\,e\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2\right)\,x\right)\,\sqrt{b\,x+c\,x^2}+\frac{1}{693\,c\,e^3}10\,\sqrt{d+e\,x}\,\left(16\,c^2\,d^2-23\,b\,c\,d\,e+3\,b^2\,e^2-7\,c\,e\,(2\,c\,d-b\,e)\,x\right)\,\left(b\,x+c\,x^2\right)^{3/2}+\frac{2\,\sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{5/2}}{11\,e}-\left(2\,\sqrt{-b}\,(2\,c\,d-b\,e)\,\left(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+99\,b^2\,c^2\,d^2\,e^2+29\,b^3\,c\,d\,e^3+8\,b^4\,e^4\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(693\,c^{5/2}\,e^6\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+\left(4\,\sqrt{-b}\,d\,(c\,d-b\,e)\,\left(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+123\,b^2\,c^2\,d^2\,e^2+5\,b^3\,c\,d\,e^3+2\,b^4\,e^4\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(693\,c^{5/2}\,e^6\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 557 leaves) :

$$\frac{1}{693\, b\, c^2\, e^6\, x^3\, (b+c\,x)^3\, \sqrt{d+e\,x}}$$

$$2\,\left(x\,(b+c\,x)\right)^{5/2}\left(b\,e\,x\,(b+c\,x)\,(d+e\,x)\,\left(-4\,b^4\,e^4+b^3\,c\,e^3\,(-7\,d+3\,e\,x)+\right.\right.$$
$$b^2\,c^2\,e^2\,\left(195\,d^2-139\,d\,e\,x+113\,e^2\,x^2\right)+b\,c^3\,e\,\left(-304\,d^3+224\,d^2\,e\,x-185\,d\,e^2\,x^2+161\,e^3\,x^3\right)+$$
$$\left.c^4\,\left(128\,d^4-96\,d^3\,e\,x+80\,d^2\,e^2\,x^2-70\,d\,e^3\,x^3+63\,e^4\,x^4\right)\right)+\sqrt{\frac{b}{c}}$$
$$\left(\sqrt{\frac{b}{c}}\,\left(-256\,c^5\,d^5+640\,b\,c^4\,d^4\,e-454\,b^2\,c^3\,d^3\,e^2+41\,b^3\,c^2\,d^2\,e^3+13\,b^4\,c\,d\,e^4+8\,b^5\,e^5\right)\,(b+c\,x)\right.$$
$$(d+e\,x)-i\,b\,e\,\left(256\,c^5\,d^5-640\,b\,c^4\,d^4\,e+454\,b^2\,c^3\,d^3\,e^2-41\,b^3\,c^2\,d^2\,e^3-13\,b^4\,c\,d\,e^4-8\,b^5\,e^5\right)$$
$$\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+$$
$$i\,b\,e\,\left(128\,c^5\,d^5-336\,b\,c^4\,d^4\,e+259\,b^2\,c^3\,d^3\,e^2-34\,b^3\,c^2\,d^2\,e^3-9\,b^4\,c\,d\,e^4-8\,b^5\,e^5\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 401: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 457 leaves, 10 steps):

$$-\frac{1}{63\, c\, e^5} 2 \sqrt{d+e x} \left(128 c^3 d^3-240 b c^2 d^2 e+111 b^2 c d e^2-b^3 e^3-3 c e \left(32 c^2 d^2-32 b c d e+b^2 e^2\right) x\right) \sqrt{b x+c x^2}-\frac{10 \sqrt{d+e x} \left(16 c d-15 b e-14 c e x\right) \left(b x+c x^2\right)^{3/2}}{63 e^3}-\frac{2 \left(b x+c x^2\right)^{5/2}}{e \sqrt{d+e x}}+\left(4 \sqrt{-b} \left(128 c^4 d^4-256 b c^3 d^3 e+135 b^2 c^2 d^2 e^2-7 b^3 c d e^3-b^4 e^4\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{d+e x}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right) \Big/ \left(63 c^{3/2} e^6 \sqrt{1+\frac{e x}{d}} \sqrt{b x+c x^2}\right)-\left(2 \sqrt{-b}\, d \left(c d-b e\right) \left(2 c d-b e\right) \left(128 c^2 d^2-128 b c d e-b^2 e^2\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{1+\frac{e x}{d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right) \Big/ \left(63 c^{3/2} e^6 \sqrt{d+e x} \sqrt{b x+c x^2}\right)$$

Result (type 4, 498 leaves):

$$\frac{1}{63\, c\, e^6 x^{5/2} \left(b+c x\right)^3 \sqrt{d+e x}} 2 \left(x \left(b+c x\right)\right)^{5/2} \left(\frac{1}{c \sqrt{x}} 2 \left(128 c^4 d^4-256 b c^3 d^3 e+135 b^2 c^2 d^2 e^2-7 b^3 c d e^3-b^4 e^4\right) \left(b+c x\right) \left(d+e x\right)-e \sqrt{x} \left(b+c x\right) \left(-b^3 e^3 \left(d+e x\right)+3 b^2 c e^2 \left(37 d^2+11 d e x-5 e^2 x^2\right)-b c^2 e \left(240 d^3+64 d^2 e x-31 d e^2 x^2+19 e^3 x^3\right)+c^3 \left(128 d^4+32 d^3 e x-16 d^2 e^2 x^2+10 d e^3 x^3-7 e^4 x^4\right)\right)-2 i \sqrt{\frac{b}{c}}\, e \left(-128 c^4 d^4+256 b c^3 d^3 e-135 b^2 c^2 d^2 e^2+7 b^3 c d e^3+b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x\, \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]+i \sqrt{\frac{b}{c}}\, e \left(-128 c^4 d^4+272 b c^3 d^3 e-159 b^2 c^2 d^2 e^2+13 b^3 c d e^3+2 b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]\right)$$

Problem 402: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b\,x+c\,x^2\right)^{5/2}}{(d+e\,x)^{5/2}}\,dx$$

Optimal (type 4, 401 leaves, 10 steps):

$$\frac{1}{21\,e^5}2\,\sqrt{d+e\,x}\,\left(128\,c^2\,d^2-176\,b\,c\,d\,e+51\,b^2\,e^2-48\,c\,e\,(2\,c\,d-b\,e)\,x\right)\,\sqrt{b\,x+c\,x^2}+\frac{10\,(16\,c\,d-7\,b\,e+2\,c\,e\,x)\,\left(b\,x+c\,x^2\right)^{3/2}}{21\,e^3\,\sqrt{d+e\,x}}-\frac{2\,\left(b\,x+c\,x^2\right)^{5/2}}{3\,e\,(d+e\,x)^{3/2}}-\left(2\,\sqrt{-b}\,(2\,c\,d-b\,e)\,\left(128\,c^2\,d^2-128\,b\,c\,d\,e+3\,b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(21\,\sqrt{c}\,e^6\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+\left(4\,\sqrt{-b}\,d\,(c\,d-b\,e)\,\left(128\,c^2\,d^2-128\,b\,c\,d\,e+27\,b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(21\,\sqrt{c}\,e^6\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 442 leaves):

$$\frac{1}{21\,e^6\,x^{5/2}\,(b+c\,x)^3\,\sqrt{d+e\,x}}2\,(x\,(b+c\,x))^{5/2}\left(-\frac{1}{c\,\sqrt{x}}\left(256\,c^3\,d^3-384\,b\,c^2\,d^2\,e+134\,b^2\,c\,d\,e^2-3\,b^3\,e^3\right)\,(b+c\,x)\,(d+e\,x)+\frac{1}{d+e\,x}e\,\sqrt{x}\,(b+c\,x)\,\left(b^2\,e^2\,\left(51\,d^2+67\,d\,e\,x+9\,e^2\,x^2\right)+b\,c\,e\,\left(-176\,d^3-224\,d^2\,e\,x-25\,d\,e^2\,x^2+9\,e^3\,x^3\right)+c^2\,\left(128\,d^4+160\,d^3\,e\,x+16\,d^2\,e^2\,x^2-6\,d\,e^3\,x^3+3\,e^4\,x^4\right)\right)+i\,\sqrt{\frac{b}{c}}\,e\,\left(-256\,c^3\,d^3+384\,b\,c^2\,d^2\,e-134\,b^2\,c\,d\,e^2+3\,b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]+i\,\sqrt{\frac{b}{c}}\,e\,\left(128\,c^3\,d^3-208\,b\,c^2\,d^2\,e+83\,b^2\,c\,d\,e^2-3\,b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)$$

Problem 403: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b x+c x^2\right)^{5/2}}{(d+e x)^{7/2}} \, dx$$

Optimal (type 4, 392 leaves, 10 steps):

$$-\frac{2 \left(128 c^2 d^2-112 b c d e+15 b^2 e^2+16 c e (2 c d-b e) x\right) \sqrt{b x+c x^2}}{15 e^5 \sqrt{d+e x}}+\frac{2 (16 c d-5 b e+6 c e x) \left(b x+c x^2\right)^{3/2}}{15 e^3 (d+e x)^{3/2}}-\frac{2 \left(b x+c x^2\right)^{5/2}}{5 e (d+e x)^{5/2}}+\left(4 \sqrt{-b} \sqrt{c} \left(128 c^2 d^2-128 b c d e+23 b^2 e^2\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{d+e x} \, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right) \Big/ \left(15 e^6 \sqrt{1+\frac{e x}{d}} \sqrt{b x+c x^2}\right)-\left(2 \sqrt{-b} (2 c d-b e) \left(128 c^2 d^2-128 b c d e+15 b^2 e^2\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{1+\frac{e x}{d}} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right) \Big/ \left(15 \sqrt{c} e^6 \sqrt{d+e x} \sqrt{b x+c x^2}\right)$$

Result (type 4, 401 leaves):

$$\frac{1}{15 e^6 x^{5/2} (b+c x)^3 \sqrt{d+e x}} 2 (x (b+c x))^{5/2} \left(\frac{2 \left(128 c^2 d^2-128 b c d e+23 b^2 e^2\right) (b+c x) (d+e x)}{\sqrt{x}}-\frac{1}{(d+e x)^2} e \sqrt{x} (b+c x) \left(b^2 e^2 \left(15 d^2+35 d e x+23 e^2 x^2\right)-b c e \left(112 d^3+256 d^2 e x+161 d e^2 x^2+11 e^3 x^3\right)+c^2 \left(128 d^4+288 d^3 e x+176 d^2 e^2 x^2+10 d e^3 x^3-3 e^4 x^4\right)\right)+2 i \sqrt{\frac{b}{c}} c e \left(128 c^2 d^2-128 b c d e+23 b^2 e^2\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]-i \sqrt{\frac{b}{c}} c e \left(128 c^2 d^2-144 b c d e+31 b^2 e^2\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]\right)$$

Problem 404: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b\,x+c\,x^2\right)^{5/2}}{\left(d+e\,x\right)^{9/2}}\,dx$$

Optimal (type 4, 474 leaves, 10 steps):

$$\left(2\,c\,\left(d\,\left(128\,c^2\,d^2-176\,b\,c\,d\,e+51\,b^2\,e^2\right)+e\,\left(32\,c^2\,d^2-32\,b\,c\,d\,e+3\,b^2\,e^2\right)\,x\right)\,\sqrt{b\,x+c\,x^2}\right)\Big/$$
$$\left(21\,d\,e^5\,\left(c\,d-b\,e\right)\,\sqrt{d+e\,x}\right)-$$
$$\left(2\,\left(c\,d^2\,\left(16\,c\,d-13\,b\,e\right)+e\,\left(22\,c^2\,d^2-22\,b\,c\,d\,e+3\,b^2\,e^2\right)\,x\right)\,\left(b\,x+c\,x^2\right)^{3/2}\right)\Big/$$
$$\left(21\,d\,e^3\,\left(c\,d-b\,e\right)\,\left(d+e\,x\right)^{5/2}\right)-\frac{2\,\left(b\,x+c\,x^2\right)^{5/2}}{7\,e\,\left(d+e\,x\right)^{7/2}}-$$
$$\left(2\,\sqrt{-b}\,\sqrt{c}\,\left(2\,c\,d-b\,e\right)\,\left(128\,c^2\,d^2-128\,b\,c\,d\,e+3\,b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(21\,d\,e^6\,\left(c\,d-b\,e\right)\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$
$$\left(4\,\sqrt{-b}\,\sqrt{c}\,\left(128\,c^2\,d^2-128\,b\,c\,d\,e+27\,b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(21\,e^6\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 500 leaves):

$$-\frac{1}{21\,b\,d\,e^6\,(c\,d-b\,e)\,x^3\,(b+c\,x)^3\,(d+e\,x)^{7/2}}\Bigg(2\,(x\,(b+c\,x))^{5/2}\Big(b\,e\,x\,(b+c\,x)\,\left(3\,b^3\,e^6\,x^3-b^2\,c\,d\,e^2\,\left(51\,d^3+169\,d^2\,e\,x+194\,d\,e^2\,x^2+85\,e^3\,x^3\right)-c^3\,d^2\,\left(128\,d^4+416\,d^3\,e\,x+464\,d^2\,e^2\,x^2+186\,d\,e^3\,x^3+7\,e^4\,x^4\right)+b\,c^2\,d\,e\,\left(176\,d^4+576\,d^3\,e\,x+649\,d^2\,e^2\,x^2+265\,d\,e^3\,x^3+7\,e^4\,x^4\right)\right)+\sqrt{\frac{b}{c}}\,c\,(d+e\,x)^3\,\Big(\sqrt{\frac{b}{c}}\,\left(256\,c^3\,d^3-384\,b\,c^2\,d^2\,e+134\,b^2\,c\,d\,e^2-3\,b^3\,e^3\right)\,(b+c\,x)\,(d+e\,x)+i\,b\,e\,\left(256\,c^3\,d^3-384\,b\,c^2\,d^2\,e+134\,b^2\,c\,d\,e^2-3\,b^3\,e^3\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e\,\left(128\,c^3\,d^3-208\,b\,c^2\,d^2\,e+83\,b^2\,c\,d\,e^2-3\,b^3\,e^3\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\Big)\Big)\Bigg)$$

Problem 405: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b\,x+c\,x^2\right)^{5/2}}{(d+e\,x)^{11/2}}\,dx$$

Optimal (type 4, 570 leaves, 10 steps):

$$-\left(\left(2\left(c\,d^2\left(128\,c^3\,d^3-240\,b\,c^2\,d^2\,e+111\,b^2\,c\,d\,e^2-b^3\,e^3\right)+e\left(160\,c^4\,d^4-320\,b\,c^3\,d^3\,e+171\,b^2\,c^2\,d^2\,e^2-11\,b^3\,c\,d\,e^3-2\,b^4\,e^4\right)x\right)\sqrt{b\,x+c\,x^2}\right)\Big/\left(63\,d^2\,e^5\,(c\,d-b\,e)^2\,(d+e\,x)^{3/2}\right)\right)-\left(2\left(d\left(16\,c^2\,d^2-11\,b\,c\,d\,e-2\,b^2\,e^2\right)+e\left(26\,c^2\,d^2-26\,b\,c\,d\,e+3\,b^2\,e^2\right)x\right)\left(b\,x+c\,x^2\right)^{3/2}\right)\Big/\left(63\,d\,e^3\,(c\,d-b\,e)\,(d+e\,x)^{7/2}\right)-\frac{2\left(b\,x+c\,x^2\right)^{5/2}}{9\,e\,(d+e\,x)^{9/2}}+\left(4\sqrt{-b}\,\sqrt{c}\left(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+135\,b^2\,c^2\,d^2\,e^2-7\,b^3\,c\,d\,e^3-b^4\,e^4\right)\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(63\,d^2\,e^6\,(c\,d-b\,e)^2\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)-\left(2\sqrt{-b}\,\sqrt{c}\,(2\,c\,d-b\,e)\left(128\,c^2\,d^2-128\,b\,c\,d\,e-b^2\,e^2\right)\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(63\,d\,e^6\,(c\,d-b\,e)\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 610 leaves) :

$$-\frac{1}{63\,b\,d^2\,e^6\,(c\,d-b\,e)^2\,x^3\,(b+c\,x)^3\,(d+e\,x)^{9/2}}2\,(x\,(b+c\,x))^{5/2}\Bigg(b\,e\,x\,(b+c\,x)\,\Big(7\,d^4\,(c\,d-b\,e)^4-19\,d^3\,(c\,d-b\,e)^2\,(2\,c^2\,d^2-3\,b\,c\,d\,e+b^2\,e^2)\,(d+e\,x)+$$
$$d^2\,(c\,d-b\,e)^2\,(88\,c^2\,d^2-88\,b\,c\,d\,e+15\,b^2\,e^2)\,(d+e\,x)^2-$$
$$d\,(c\,d-b\,e)\,(122\,c^3\,d^3-183\,b\,c^2\,d^2\,e+63\,b^2\,c\,d\,e^2-b^3\,e^3)\,(d+e\,x)^3+$$
$$(193\,c^4\,d^4-386\,b\,c^3\,d^3\,e+207\,b^2\,c^2\,d^2\,e^2-14\,b^3\,c\,d\,e^3-2\,b^4\,e^4)\,(d+e\,x)^4\Big)-$$
$$\sqrt{\frac{b}{c}}\,c\,(d+e\,x)^4\Bigg(-2\sqrt{\frac{b}{c}}\,(-128\,c^4\,d^4+256\,b\,c^3\,d^3\,e-135\,b^2\,c^2\,d^2\,e^2+7\,b^3\,c\,d\,e^3+b^4\,e^4)$$
$$(b+c\,x)\,(d+e\,x)+2\,i\,b\,e\,(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+135\,b^2\,c^2\,d^2\,e^2-7\,b^3\,c\,d\,e^3-b^4\,e^4)$$
$$\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\Big],\frac{c\,d}{b\,e}\Big]-$$
$$i\,b\,e\,(128\,c^4\,d^4-272\,b\,c^3\,d^3\,e+159\,b^2\,c^2\,d^2\,e^2-13\,b^3\,c\,d\,e^3-2\,b^4\,e^4)$$
$$\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\Big],\frac{c\,d}{b\,e}\Big]\Bigg)\Bigg)$$

Problem 406: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 379 leaves, 10 steps):

$$\frac{2 e \left(71 c^2 d^2 - 71 b c d e + 24 b^2 e^2\right) \sqrt{d + e x} \sqrt{b x + c x^2}}{105 c^3} + \frac{12 e (2 c d - b e) (d + e x)^{3/2} \sqrt{b x + c x^2}}{35 c^2} + \frac{2 e (d + e x)^{5/2} \sqrt{b x + c x^2}}{7 c} + \left(16 \sqrt{-b} (2 c d - b e) \left(11 c^2 d^2 - 11 b c d e + 6 b^2 e^2\right) \sqrt{x} \sqrt{1 + \frac{c x}{b}} \sqrt{d + e x} \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Big/ \left(105 c^{7/2} \sqrt{1 + \frac{e x}{d}} \sqrt{b x + c x^2}\right) - \left(2 \sqrt{-b} d (c d - b e) \left(71 c^2 d^2 - 71 b c d e + 24 b^2 e^2\right) \sqrt{x} \sqrt{1 + \frac{c x}{b}} \sqrt{1 + \frac{e x}{d}} \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Big/ \left(105 c^{7/2} \sqrt{d + e x} \sqrt{b x + c x^2}\right)$$

Result (type 4, 388 leaves):

$$\frac{1}{105 c^3 \sqrt{x (b + c x)} \sqrt{d + e x}} 2 \sqrt{x} \left(\frac{8 \left(22 c^3 d^3 - 33 b c^2 d^2 e + 23 b^2 c d e^2 - 6 b^3 e^3\right) (b + c x) (d + e x)}{c \sqrt{x}} + e \sqrt{x} (b + c x) (d + e x) \left(24 b^2 e^2 - b c e (89 d + 18 e x) + c^2 \left(122 d^2 + 66 d e x + 15 e^2 x^2\right)\right) + 8 i \sqrt{\frac{b}{c}} e \left(22 c^3 d^3 - 33 b c^2 d^2 e + 23 b^2 c d e^2 - 6 b^3 e^3\right) \sqrt{1 + \frac{b}{c x}} \sqrt{1 + \frac{d}{e x}} x \,\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right] + \frac{1}{b} i \sqrt{\frac{b}{c}} \left(105 c^4 d^4 - 298 b c^3 d^3 e + 353 b^2 c^2 d^2 e^2 - 208 b^3 c d e^3 + 48 b^4 e^4\right) \sqrt{1 + \frac{b}{c x}} \sqrt{1 + \frac{d}{e x}} x \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)$$

Problem 407: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e\,x)^{5/2}}{\sqrt{b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 303 leaves, 9 steps):

$$\frac{8\,e\,(2\,c\,d-b\,e)\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}}{15\,c^2}+\frac{2\,e\,(d+e\,x)^{3/2}\,\sqrt{b\,x+c\,x^2}}{5\,c}+\left(2\,\sqrt{-b}\,\left(23\,c^2\,d^2-23\,b\,c\,d\,e+8\,b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(15\,c^{5/2}\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)-\left(8\,\sqrt{-b}\,d\,(c\,d-b\,e)\,(2\,c\,d-b\,e)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(15\,c^{5/2}\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 314 leaves):

$$\left(2\,\sqrt{x}\,\left(\frac{\left(23\,c^2\,d^2-23\,b\,c\,d\,e+8\,b^2\,e^2\right)\,(b+c\,x)\,(d+e\,x)}{c\,\sqrt{x}}+e\,\sqrt{x}\,(b+c\,x)\,(d+e\,x)\,(11\,c\,d-4\,b\,e+3\,c\,e\,x)+i\,\sqrt{\frac{b}{c}}\,e\,\left(23\,c^2\,d^2-23\,b\,c\,d\,e+8\,b^2\,e^2\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-\frac{1}{b}\,i\,\sqrt{\frac{b}{c}}\,\left(-15\,c^3\,d^3+34\,b\,c^2\,d^2\,e-27\,b^2\,c\,d\,e^2+8\,b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)\Big/\left(15\,c^2\,\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}\right)$$

Problem 408: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 241 leaves, 8 steps):

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

Result (type 4, 246 leaves):

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

Problem 412: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 317 leaves, 9 steps):

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

Result (type 4, 290 leaves) :

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

Problem 413: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 403 leaves, 10 steps) :

$$-\frac{2 e \sqrt{b x+c x^2}}{5 d (c d-b e) (d+e x)^{5/2}}-\frac{8 e (2 c d-b e) \sqrt{b x+c x^2}}{15 d^2 (c d-b e)^2 (d+e x)^{3/2}}-\frac{2 e \left(23 c^2 d^2-23 b c d e+8 b^2 e^2\right) \sqrt{b x+c x^2}}{15 d^3 (c d-b e)^3 \sqrt{d+e x}}+$$

$$\left(2 \sqrt{-b} \sqrt{c} \left(23 c^2 d^2-23 b c d e+8 b^2 e^2\right) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{d+e x}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Bigg/ \left(15 d^3 (c d-b e)^3 \sqrt{1+\frac{e x}{d}} \sqrt{b x+c x^2}\right)-$$

$$\left(8 \sqrt{-b} \sqrt{c} (2 c d-b e) \sqrt{x} \sqrt{1+\frac{c x}{b}} \sqrt{1+\frac{e x}{d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c} \sqrt{x}}{\sqrt{-b}}\right], \frac{b e}{c d}\right]\right) \Bigg/ \left(15 d^2 (c d-b e)^2 \sqrt{d+e x} \sqrt{b x+c x^2}\right)$$

Result (type 4, 381 leaves):

$$-\frac{1}{15 b d^3 (c d-b e)^3 \sqrt{x (b+c x)} (d+e x)^{5/2}} 2 \Bigg(b e x (b+c x) \left(3 d^2 (c d-b e)^2+4 d (c d-b e) (2 c d-b e) (d+e x)+\left(23 c^2 d^2-23 b c d e+8 b^2 e^2\right) (d+e x)^2\right)-$$

$$\sqrt{\frac{b}{c}}\, c (d+e x)^2 \Bigg(\sqrt{\frac{b}{c}} \left(23 c^2 d^2-23 b c d e+8 b^2 e^2\right) (b+c x) (d+e x)+$$

$$i b e \left(23 c^2 d^2-23 b c d e+8 b^2 e^2\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}$$

$$\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]+i \left(15 c^3 d^3-34 b c^2 d^2 e+27 b^2 c d e^2-8 b^3 e^3\right)$$

$$\sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\Bigg)\Bigg)$$

Problem 414: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 395 leaves, 10 steps):

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

Result (type 4, 360 leaves):

$$-\frac{1}{3 b^3 c^2 \sqrt{x (b+c x)} \sqrt{d+e x}} 2 \left(b (d+e x) \left(3 (c d-b e)^3 x+3 c^2 d^3 (b+c x)-b^2 e^3 x (b+c x)\right)-\sqrt{\frac{b}{c}} \left(\sqrt{\frac{b}{c}} \left(6 c^3 d^3-9 b c^2 d^2 e+19 b^2 c d e^2-8 b^3 e^3\right) (b+c x) (d+e x)+i b e \left(6 c^3 d^3-9 b c^2 d^2 e+19 b^2 c d e^2-8 b^3 e^3\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]-i b e \left(3 c^3 d^3-18 b c^2 d^2 e+23 b^2 c d e^2-8 b^3 e^3\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)\right)$$

Problem 415: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 310 leaves, 9 steps):

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

Result (type 4, 262 leaves):

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

Problem 416: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 249 leaves, 8 steps):

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

Result (type 4, 210 leaves):

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

Problem 417: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 231 leaves, 8 steps):

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

Result (type 4, 186 leaves):

$$\left(2\sqrt{\frac{b}{c}}\,(d+e\,x)+4\,\mathrm{i}\,e\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-\right.$$

$$\left.2\,\mathrm{i}\,e\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\Big/$$

$$\left(b\,\sqrt{\frac{b}{c}}\,\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}\right)$$

Problem 418: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 274 leaves, 8 steps):

$$-\frac{2\sqrt{d+e\,x}\,\left(b\,(c\,d-b\,e)+c\,(2\,c\,d-b\,e)\,x\right)}{b^2\,d\,(c\,d-b\,e)\,\sqrt{b\,x+c\,x^2}}+$$

$$\left(2\sqrt{c}\,(2\,c\,d-b\,e)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/$$

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

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

Result (type 4, 220 leaves):

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

Problem 419: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 370 leaves, 9 steps):

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

Result (type 4, 266 leaves):

$$\Bigg(2\,b\,d\,\left(b^2 e^2 + b\,c\,e^2\,x + c^2\,d\,(d+e\,x)\right) +$$

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

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

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\Bigg) \Big/ \left(b^2 d^2\,(c\,d-b\,e)^2\,\sqrt{x\,(b+c\,x)}\,\sqrt{d+e\,x}\right)$$

Problem 420: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 478 leaves, 10 steps):

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

$$\frac{2\,e\,(2\,c\,d-b\,e)\,\left(3\,c^2 d^2 - 3\,b\,c\,d\,e + 8\,b^2 e^2\right)\sqrt{b\,x+c\,x^2}}{3\,b^2 d^3\,(c\,d-b\,e)^3\,\sqrt{d+e\,x}} +$$

$$\left(2\,\sqrt{c}\,(2\,c\,d-b\,e)\,\left(3\,c^2 d^2 - 3\,b\,c\,d\,e + 8\,b^2 e^2\right)\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$

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

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

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

Result (type 4, 420 leaves):

$$-\frac{1}{3\,b^3\,d^3\,(c\,d-b\,e)^3\,\sqrt{x\,(b+c\,x)}\,(d+e\,x)^{3/2}}$$
$$2\left(b\left(b^2\,d\,e^3\,(c\,d-b\,e)\,x\,(b+c\,x)-5\,b^2\,e^3\,(-2\,c\,d+b\,e)\,x\,(b+c\,x)\,(d+e\,x)+\right.\right.$$
$$\left.3\,c^4\,d^3\,x\,(d+e\,x)^2+3\,(c\,d-b\,e)^3\,(b+c\,x)\,(d+e\,x)^2\right)-$$
$$\sqrt{\frac{b}{c}}\,c\,(d+e\,x)\left(\sqrt{\frac{b}{c}}\,\left(6\,c^3\,d^3-9\,b\,c^2\,d^2\,e+19\,b^2\,c\,d\,e^2-8\,b^3\,e^3\right)\,(b+c\,x)\,(d+e\,x)+\right.$$
$$i\,b\,e\,\left(6\,c^3\,d^3-9\,b\,c^2\,d^2\,e+19\,b^2\,c\,d\,e^2-8\,b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e\,\left(3\,c^3\,d^3-18\,b\,c^2\,d^2\,e+23\,b^2\,c\,d\,e^2-8\,b^3\,e^3\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 421: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^{9/2}}{\left(b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 470 leaves, 10 steps):

$$-\frac{2\,(d+e\,x)^{7/2}\,(b\,d+(2\,c\,d-b\,e)\,x)}{3\,b^2\,(b\,x+c\,x^2)^{3/2}}+\frac{1}{3\,b^4\,c\,\sqrt{b\,x+c\,x^2}}$$
$$2\,(d+e\,x)^{3/2}\,(b\,c\,d^2\,(8\,c\,d-11\,b\,e)+(2\,c\,d-b\,e)\,(8\,c^2\,d^2-8\,b\,c\,d\,e-3\,b^2\,e^2)\,x)-$$
$$\frac{8\,e\,(4\,c^3\,d^3-6\,b\,c^2\,d^2\,e+b^3\,e^3)\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}}{3\,b^4\,c^2}-$$
$$\left(2\,(16\,c^4\,d^4-32\,b\,c^3\,d^3\,e+9\,b^2\,c^2\,d^2\,e^2+7\,b^3\,c\,d\,e^3-8\,b^4\,e^4)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\bigg/\left(3\,(-b)^{7/2}\,c^{5/2}\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$
$$\left(8\,d\,(c\,d-b\,e)\,(2\,c\,d-b\,e)\,(2\,c^2\,d^2-2\,b\,c\,d\,e-b^2\,e^2)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\bigg/\left(3\,(-b)^{7/2}\,c^{5/2}\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 451 leaves):

$$\frac{1}{3 b^5 c^2 \left(x (b+c x)\right)^{3/2} \sqrt{d+e x}} 2 \left(b (d+e x) \left(b (c d-b e)^4 x^2+(c d-b e)^3 (8 c d+5 b e) x^2 (b+c x)-b c^2 d^4 (b+c x)^2+c^2 d^3 (8 c d-13 b e) x (b+c x)^2\right)-\sqrt{\frac{b}{c}}\, x (b+c x) \left(\sqrt{\frac{b}{c}} \left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right) (b+c x) (d+e x)+i b e \left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]-i b e \left(8 c^4 d^4-17 b c^3 d^3 e+6 b^2 c^2 d^2 e^2+11 b^3 c d e^3-8 b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)\right)$$

Problem 422: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^{7/2}}{\left(b x+c x^2\right)^{5/2}}\, dx$$

Optimal (type 4, 383 leaves, 9 steps):

$$-\frac{2\,(d+e\,x)^{5/2}\,\left(b\,d+(2\,c\,d-b\,e)\,x\right)}{3\,b^2\,\left(b\,x+c\,x^2\right)^{3/2}}+\frac{1}{3\,b^4\,c\,\sqrt{b\,x+c\,x^2}}$$
$$2\,\sqrt{d+e\,x}\,\left(b\,c\,d^2\,(8\,c\,d-9\,b\,e)+(2\,c\,d-b\,e)\,\left(8\,c^2\,d^2-8\,b\,c\,d\,e-b^2\,e^2\right)\,x\right)-$$
$$\left(4\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{d+e\,x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(3\,(-b)^{7/2}\,c^{3/2}\,\sqrt{1+\frac{e\,x}{d}}\,\sqrt{b\,x+c\,x^2}\right)+$$
$$\left(2\,d\,(c\,d-b\,e)\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e-b^2\,e^2\right)\,\sqrt{x}\,\sqrt{1+\frac{c\,x}{b}}\,\sqrt{1+\frac{e\,x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\,\sqrt{x}}{\sqrt{-b}}\right],\frac{b\,e}{c\,d}\right]\right)\Big/\left(3\,(-b)^{7/2}\,c^{3/2}\,\sqrt{d+e\,x}\,\sqrt{b\,x+c\,x^2}\right)$$

Result (type 4, 405 leaves):

$$\frac{1}{3\,b^5\,c\,\left(x\,(b+c\,x)\right)^{3/2}\,\sqrt{d+e\,x}}$$
$$2\left(b\,(d+e\,x)\,\left(b\,(c\,d-b\,e)^3\,x^2+2\,(c\,d-b\,e)^2\,(4\,c\,d+b\,e)\,x^2\,(b+c\,x)-b\,c\,d^3\,(b+c\,x)^2+\right.\right.$$
$$\left.2\,c\,d^2\,(4\,c\,d-5\,b\,e)\,x\,(b+c\,x)^2\right)-$$
$$\sqrt{\frac{b}{c}}\,x\,(b+c\,x)\,\left(2\,\sqrt{\frac{b}{c}}\,\left(8\,c^3\,d^3-12\,b\,c^2\,d^2\,e+2\,b^2\,c\,d\,e^2+b^3\,e^3\right)\,(b+c\,x)\,(d+e\,x)+\right.$$
$$2\,i\,b\,e\,\left(8\,c^3\,d^3-12\,b\,c^2\,d^2\,e+2\,b^2\,c\,d\,e^2+b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e\,\left(8\,c^3\,d^3-13\,b\,c^2\,d^2\,e+3\,b^2\,c\,d\,e^2+2\,b^3\,e^3\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 423: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e\,x)^{5/2}}{\left(b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 343 leaves, 9 steps):

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

Result (type 4, 353 leaves):

$$\frac{1}{3 b^5 \left(x (b+c x)\right)^{3/2} \sqrt{d+e x}} \left(2 \left(b (d+e x) \left(16 c^3 d^2 x^3+8 b c^2 d x^2 (3 d-2 e x)-b^3 \left(d^2+7 d e x-2 e^2 x^2\right)+b^2 c x \left(6 d^2-25 d e x+e^2 x^2\right)\right)-\sqrt{\frac{b}{c}}\, x (b+c x) \left(\sqrt{\frac{b}{c}} \left(16 c^2 d^2-16 b c d e+b^2 e^2\right) (b+c x) (d+e x)+i b e \left(16 c^2 d^2-16 b c d e+b^2 e^2\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]-i b e \left(8 c^2 d^2-9 b c d e+b^2 e^2\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)\right)\right)$$

Problem 424: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 344 leaves, 9 steps):

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

Result (type 4, 290 leaves) :

$$\left(2\left(-8 (2 c d-b e) x (b+c x)(d+e x)+\frac{1}{b+c x}\right.\right.$$
$$(d+e x)\left(16 c^3 d x^3+b^2 c x (6 d-13 e x)-8 b c^2 x^2(-3 d+e x)-b^3(d+4 e x)\right)+$$
$$8\,i\sqrt{\frac{b}{c}}\,c e(-2 c d+b e)\sqrt{1+\frac{b}{c x}}\,\sqrt{1+\frac{d}{e x}}\,x^{5/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]+$$
$$\left.\left.i\sqrt{\frac{b}{c}}\,c e(8 c d-5 b e)\sqrt{1+\frac{b}{c x}}\,\sqrt{1+\frac{d}{e x}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c d}{b e}\right]\right)\right)\Big/$$
$$\left(3 b^4 x\sqrt{x (b+c x)}\,\sqrt{d+e x}\right)$$

Problem 425: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{d+e x}}{\left(b x+c x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 359 leaves, 9 steps) :

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

Result (type 4, 375 leaves):

$$\frac{1}{3\,b^5\,d\,(c\,d-b\,e)\,(x\,(b+c\,x))^{3/2}\,\sqrt{d+e\,x}}2\left(b\,(d+e\,x)\,\left(b\,c^2\,d\,(c\,d-b\,e)\,x^2+c^2\,d\,(8\,c\,d-7\,b\,e)\,x^2\,(b+c\,x)+b\,d\,(-c\,d+b\,e)\,(b+c\,x)^2+(c\,d-b\,e)\,(8\,c\,d-b\,e)\,x\,(b+c\,x)^2\right)-\sqrt{\frac{b}{c}}\,c\,x\,(b+c\,x)\left(\sqrt{\frac{b}{c}}\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2\right)\,(b+c\,x)\,(d+e\,x)+i\,b\,e\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2\right)\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-i\,b\,e\left(8\,c^2\,d^2-9\,b\,c\,d\,e+b^2\,e^2\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 426: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{d+e\,x}\,\left(b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 451 leaves, 9 steps):

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

Result (type 4, 429 leaves):

$$\frac{1}{3\,b^5\,d^2\,\left(c\,d-b\,e\right)^2\,\left(x\,\left(b+c\,x\right)\right)^{3/2}\,\sqrt{d+e\,x}}$$
$$2\,\Bigg(b\,\left(d+e\,x\right)\,\left(b\,c^3\,d^2\,\left(c\,d-b\,e\right)\,x^2+2\,c^3\,d^2\,\left(4\,c\,d-5\,b\,e\right)\,x^2\,\left(b+c\,x\right)-\right.$$
$$\left.b\,d\,\left(c\,d-b\,e\right)^2\,\left(b+c\,x\right)^2+2\,\left(c\,d-b\,e\right)^2\,\left(4\,c\,d+b\,e\right)\,x\,\left(b+c\,x\right)^2\right)-$$
$$\sqrt{\frac{b}{c}}\,c\,x\,\left(b+c\,x\right)\,\Bigg(2\,\sqrt{\frac{b}{c}}\,\left(8\,c^3\,d^3-12\,b\,c^2\,d^2\,e+2\,b^2\,c\,d\,e^2+b^3\,e^3\right)\,\left(b+c\,x\right)\,\left(d+e\,x\right)+$$
$$2\,\mathrm{i}\,b\,e\,\left(8\,c^3\,d^3-12\,b\,c^2\,d^2\,e+2\,b^2\,c\,d\,e^2+b^3\,e^3\right)\,\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}$$
$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]-\mathrm{i}\,b\,e\,\left(8\,c^3\,d^3-13\,b\,c^2\,d^2\,e+3\,b^2\,c\,d\,e^2+2\,b^3\,e^3\right)$$
$$\left.\left.\sqrt{1+\frac{b}{c\,x}}\,\sqrt{1+\frac{d}{e\,x}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right],\frac{c\,d}{b\,e}\right]\right)\right)$$

Problem 427: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 567 leaves, 10 steps):

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

$$\left(2\left(b\left(c d-b e\right)\left(8 c^2 d^2-3 b c d e-4 b^2 e^2\right)+4 c\left(4 c^3 d^3-6 b c^2 d^2 e+b^3 e^3\right) x\right)\right)\Big/$$
$$\left(3 b^4 d^2\left(c d-b e\right)^2\sqrt{d+e x}\sqrt{b x+c x^2}\right)+$$

$$\left(2 e\left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right)\sqrt{b x+c x^2}\right)\Big/$$
$$\left(3 b^4 d^3\left(c d-b e\right)^3\sqrt{d+e x}\right)-$$

$$\left(2\sqrt{c}\left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right)\sqrt{x}\sqrt{1+\frac{c x}{b}}\sqrt{d+e x}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{c}\sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right)\Big/\left(3\left(-b\right)^{7/2} d^3\left(c d-b e\right)^3\sqrt{1+\frac{e x}{d}}\sqrt{b x+c x^2}\right)+$$

$$\left(8\sqrt{c}\left(2 c d-b e\right)\left(2 c^2 d^2-2 b c d e-b^2 e^2\right)\sqrt{x}\sqrt{1+\frac{c x}{b}}\sqrt{1+\frac{e x}{d}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{c}\sqrt{x}}{\sqrt{-b}}\right],\frac{b e}{c d}\right]\right)\Big/\left(3\left(-b\right)^{7/2} d^2\left(c d-b e\right)^2\sqrt{d+e x}\sqrt{b x+c x^2}\right)$$

Result (type 4, 504 leaves) :

$$-\frac{1}{3 b^5 d^3 (c d-b e)^3 (x (b+c x))^{3/2} \sqrt{d+e x}}2 \left(b \left(3 b^4 e^5 x^2 (b+c x)^2+b c^4 d^3 (-c d+b e) x^2 (d+e x)-c^4 d^3 (8 c d-13 b e) x^2 (b+c x) (d+e x)+b d (c d-b e)^3 (b+c x)^2 (d+e x)-(c d-b e)^3 (8 c d+5 b e) x (b+c x)^2 (d+e x)\right)+\sqrt{\frac{b}{c}} c x (b+c x) \left(\sqrt{\frac{b}{c}} \left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right) (b+c x) (d+e x)+i b e \left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+7 b^3 c d e^3-8 b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]-i b e \left(8 c^4 d^4-17 b c^3 d^3 e+6 b^2 c^2 d^2 e^2+11 b^3 c d e^3-8 b^4 e^4\right) \sqrt{1+\frac{b}{c x}} \sqrt{1+\frac{d}{e x}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{b}{c}}}{\sqrt{x}}\right], \frac{c d}{b e}\right]\right)\right)$$

Problem 428: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 51 leaves, 4 steps):

$$\frac{2 \sqrt{d+e x} \, \text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{3}{2}} \sqrt{x}\right], -\frac{2 e}{3 d}\right]}{\sqrt{3} \sqrt{1+\frac{e x}{d}}}$$

Result (type 4, 117 leaves):

$$\left(2\sqrt{-\frac{d}{e}}\;(-2+3\,x)\;(d+e\,x)-2\,d\,\sqrt{9-\frac{6}{x}}\;\sqrt{1+\frac{d}{e\,x}}\;x^{3/2}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-\frac{d}{e}}}{\sqrt{x}}\right],\,-\frac{2\,e}{3\,d}\right]\right)\Big/$$
$$\left(3\,\sqrt{-\frac{d}{e}}\;\sqrt{-x\,(-2+3\,x)}\;\sqrt{d+e\,x}\right)$$

Problem 430: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{2\,\sqrt{d+e\,x}\;\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{3}{2}}\;\sqrt{-x}\right],\,\frac{2\,e}{3\,d}\right]}{\sqrt{3}\;\sqrt{1+\frac{e\,x}{d}}}$$

Result (type 4, 117 leaves):

$$\left(2\sqrt{-\frac{d}{e}}\;(2+3\,x)\;(d+e\,x)-2\,d\,\sqrt{9+\frac{6}{x}}\;\sqrt{1+\frac{d}{e\,x}}\;x^{3/2}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-\frac{d}{e}}}{\sqrt{x}}\right],\,\frac{2\,e}{3\,d}\right]\right)\Big/$$
$$\left(3\,\sqrt{-\frac{d}{e}}\;\sqrt{-x\,(2+3\,x)}\;\sqrt{d+e\,x}\right)$$

Problem 431: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{2\,\sqrt{1+\frac{e\,x}{d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{3}{2}}\;\sqrt{-x}\right],\,\frac{2\,e}{3\,d}\right]}{\sqrt{3}\;\sqrt{d+e\,x}}$$

Result (type 4, 82 leaves):

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

Problem 432: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 12 leaves, 1 step):

$$-2\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{-x}\right],-1\right]$$

Result (type 4, 60 leaves):

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

Problem 433: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 12 leaves, 2 steps):

$$-2\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{-x}\right],-1\right]$$

Result (type 4, 60 leaves):

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

Problem 444: Unable to integrate problem.

$$\int\frac{(d+e\,x)^m}{\left(b\,x+c\,x^2\right)^2}\,dx$$

Optimal (type 5, 180 leaves, 5 steps):

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

Result (type 8, 21 leaves):

$$\int\frac{(d+e\,x)^m}{\left(b\,x+c\,x^2\right)^2}\,dx$$

Problem 445: Unable to integrate problem.

$$\int\frac{(d+e\,x)^m}{\left(b\,x+c\,x^2\right)^3}\,dx$$

Optimal (type 5, 350 leaves, 6 steps):

$$-\frac{(d+e\,x)^{1+m}\,\left(b\,(c\,d-b\,e)+c\,(2\,c\,d-b\,e)\,x\right)}{2\,b^2\,d\,(c\,d-b\,e)\,\left(b\,x+c\,x^2\right)^2}+\left((d+e\,x)^{1+m}\,\left(b\,(c\,d-b\,e)\,\left(6\,c^2\,d^2-b^2\,e^2\,(1-m)-b\,c\,d\,e\,(4+m)\right)+c\,(2\,c\,d-b\,e)\,\left(6\,c^2\,d^2-6\,b\,c\,d\,e-b^2\,e^2\,(1-m)\right)\,x\right)\right)\Big/\left(2\,b^4\,d^2\,(c\,d-b\,e)^2\,\left(b\,x+c\,x^2\right)\right)+\left(c^3\,\left(12\,c^2\,d^2-6\,b\,c\,d\,e\,(4-m)+b^2\,e^2\,\left(12-7\,m+m^2\right)\right)\,(d+e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,1+m,2+m,\frac{c\,(d+e\,x)}{c\,d-b\,e}\right]\right)\Big/\left(2\,b^5\,(c\,d-b\,e)^3\,(1+m)\right)-\frac{1}{2\,b^5\,d^3\,(1+m)}\left(12\,c^2\,d^2-6\,b\,c\,d\,e\,m-b^2\,e^2\,(1-m)\,m\right)\,(d+e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,1+m,2+m,1+\frac{e\,x}{d}\right]$$

Result (type 8, 21 leaves):

$$\int\frac{(d+e\,x)^m}{\left(b\,x+c\,x^2\right)^3}\,dx$$

Problem 446: Result more than twice size of optimal antiderivative.

$$\int(d+e\,x)^m\,\left(b\,x+c\,x^2\right)^{3/2}\,dx$$

Optimal (type 6, 105 leaves, 2 steps):

$$\left((d+e\,x)^{1+m}\,\left(b\,x+c\,x^2\right)^{3/2}\,\text{AppellF1}\left[1+m,-\frac{3}{2},-\frac{3}{2},2+m,\frac{d+e\,x}{d},\frac{c\,(d+e\,x)}{c\,d-b\,e}\right]\right)\Big/\left(e\,(1+m)\,\left(-\frac{e\,x}{d}\right)^{3/2}\,\left(1-\frac{c\,(d+e\,x)}{c\,d-b\,e}\right)^{3/2}\right)$$

Result (type 6, 289 leaves):

$$\frac{2}{35} b d x^2 \sqrt{x (b + c x)} (d + e x)^m \left(\left(49 b \text{AppellF1}\left[\frac{5}{2}, -\frac{1}{2}, -m, \frac{7}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) \Big/ \left(7 b d \text{AppellF1}\left[\frac{5}{2}, -\frac{1}{2}, -m, \frac{7}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + 2 b e m x \text{AppellF1}\left[\frac{7}{2}, -\frac{1}{2}, 1 - m, \frac{9}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + c d x \text{AppellF1}\left[\frac{7}{2}, \frac{1}{2}, -m, \frac{9}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) + \left(45 c x \text{AppellF1}\left[\frac{7}{2}, -\frac{1}{2}, -m, \frac{9}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) \Big/ \left(9 b d \text{AppellF1}\left[\frac{7}{2}, -\frac{1}{2}, -m, \frac{9}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + 2 b e m x \text{AppellF1}\left[\frac{9}{2}, -\frac{1}{2}, 1 - m, \frac{11}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + c d x \text{AppellF1}\left[\frac{9}{2}, \frac{1}{2}, -m, \frac{11}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right)\right)$$

Problem 449: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 105 leaves, 2 steps):

$$\left(\left(-\frac{e x}{d}\right)^{3/2} (d + e x)^{1+m} \left(1 - \frac{c (d + e x)}{c d - b e}\right)^{3/2} \text{AppellF1}\left[1 + m, \frac{3}{2}, \frac{3}{2}, 2 + m, \frac{d + e x}{d}, \frac{c (d + e x)}{c d - b e}\right]\right) \Big/ \left(e (1 + m) (b x + c x^2)^{3/2}\right)$$

Result (type 6, 433 leaves):

$$\frac{1}{(x (b + c x))^{3/2}} 2 d x (d + e x)^m \left(-\left(\left((b + c x)^2 \text{AppellF1}\left[-\frac{1}{2}, -\frac{1}{2}, -m, \frac{1}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) \Big/ \left(b \left(b d \text{AppellF1}\left[-\frac{1}{2}, -\frac{1}{2}, -m, \frac{1}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + 2 b e m x \text{AppellF1}\left[\frac{1}{2}, -\frac{1}{2}, 1 - m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + c d x \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right)\right)\right) - \left(3 c x (b + c x) \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) \Big/ \left(b \left(3 b d \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + 2 b e m x \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}, 1 - m, \frac{5}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] - c d x \text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}, -m, \frac{5}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right)\right) - \left(3 c x \text{AppellF1}\left[\frac{1}{2}, \frac{3}{2}, -m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right) \Big/ \left(3 b d \text{AppellF1}\left[\frac{1}{2}, \frac{3}{2}, -m, \frac{3}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] + 2 b e m x \text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}, 1 - m, \frac{5}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right] - 3 c d x \text{AppellF1}\left[\frac{3}{2}, \frac{5}{2}, -m, \frac{5}{2}, -\frac{c x}{b}, -\frac{e x}{d}\right]\right)\right)$$

Problem 618: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 781 leaves, 12 steps):

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

Result (type 3, 217 leaves) :

$$\frac{2 e \sqrt{d+e x}\ (7 d+e x)}{3 c}-\frac{i \left(\sqrt{c}\ d-i \sqrt{a}\ e\right)^3 \text{ArcTanh}\left[\frac{\sqrt{c}\ \sqrt{d+e x}}{\sqrt{c d-i \sqrt{a}\ \sqrt{c}\ e}}\right]}{\sqrt{a}\ c^{3/2} \sqrt{c d-i \sqrt{a}\ \sqrt{c}\ e}}+\frac{i \left(\sqrt{c}\ d+i \sqrt{a}\ e\right)^3 \text{ArcTanh}\left[\frac{\sqrt{c}\ \sqrt{d+e x}}{\sqrt{c d+i \sqrt{a}\ \sqrt{c}\ e}}\right]}{\sqrt{a}\ c^{3/2} \sqrt{c d+i \sqrt{a}\ \sqrt{c}\ e}}$$

Problem 619: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 689 leaves, 11 steps) :

$$\frac{2 e \sqrt{d+e x}}{c}-\left(e \left(c d^2+a e^2-2 \sqrt{c}\ d \sqrt{c d^2+a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}-\sqrt{2}\ c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\ d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(\sqrt{2}\ c^{5/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\ d-\sqrt{c d^2+a e^2}}\right)+$$
$$\left(e \left(c d^2+a e^2-2 \sqrt{c}\ d \sqrt{c d^2+a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}+\sqrt{2}\ c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\ d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(\sqrt{2}\ c^{5/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\ d-\sqrt{c d^2+a e^2}}\right)+\left(e \left(c d^2+a e^2+2 \sqrt{c}\ d \sqrt{c d^2+a e^2}\right)\right.$$
$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\ c^{1/4} \sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}\ \sqrt{d+e x}+\sqrt{c}\ (d+e x)\right]\right) \Big/$$
$$\left(2 \sqrt{2}\ c^{5/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}\right)-\left(e \left(c d^2+a e^2+2 \sqrt{c}\ d \sqrt{c d^2+a e^2}\right)\right.$$
$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\ c^{1/4} \sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}\ \sqrt{d+e x}+\sqrt{c}\ (d+e x)\right]\right) \Big/$$
$$\left(2 \sqrt{2}\ c^{5/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\ d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 204 leaves) :

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

Problem 620: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d+e x}}{a+c x^2} \, dx$$

Optimal (type 3, 478 leaves, 10 steps):

$$\frac{e \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}-\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]}{\sqrt{2}\, c^{3/4} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}-\frac{e \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}+\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]}{\sqrt{2}\, c^{3/4} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}+$$

$$\left(e \text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\, \sqrt{d+e x}+\sqrt{c}\, (d+e x)\right]\right) \Big/$$

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

$$\left(e \text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\, \sqrt{d+e x}+\sqrt{c}\, (d+e x)\right]\right) \Big/$$

$$\left(2 \sqrt{2}\, c^{3/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 140 leaves):

$$-\frac{1}{\sqrt{a}\, c} i \left(\sqrt{c d-i \sqrt{a} \sqrt{c} e}\, \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{d+e x}}{\sqrt{c d-i \sqrt{a} \sqrt{c} e}}\right]-\sqrt{c d+i \sqrt{a} \sqrt{c} e}\, \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{d+e x}}{\sqrt{c d+i \sqrt{a} \sqrt{c} e}}\right]\right)$$

Problem 621: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{d+e x}\, \left(a+c x^2\right)} \, dx$$

Optimal (type 3, 538 leaves, 10 steps):

$$\frac{e\,\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}-\sqrt{2}\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]}{\sqrt{2}\,c^{1/4}\,\sqrt{c\,d^2+a\,e^2}\,\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}-\frac{e\,\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}+\sqrt{2}\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]}{\sqrt{2}\,c^{1/4}\,\sqrt{c\,d^2+a\,e^2}\,\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}-\left(e\,\text{Log}\left[\sqrt{c\,d^2+a\,e^2}-\sqrt{2}\,c^{1/4}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,(d+e\,x)\right]\right)\Big/\left(2\sqrt{2}\,c^{1/4}\,\sqrt{c\,d^2+a\,e^2}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)+\left(e\,\text{Log}\left[\sqrt{c\,d^2+a\,e^2}+\sqrt{2}\,c^{1/4}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,(d+e\,x)\right]\right)\Big/\left(2\sqrt{2}\,c^{1/4}\,\sqrt{c\,d^2+a\,e^2}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)$$

Result (type 3, 137 leaves):

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

Problem 622: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 663 leaves, 11 steps):

$$-\frac{2 e}{\left(c d^2+a e^2\right) \sqrt{d+e x}}+\left(c^{1/4} e \left(2 \sqrt{c} d-\sqrt{c d^2+a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}-\sqrt{2} c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(\sqrt{2} \left(c d^2+a e^2\right)^{3/2} \sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}\right)-\left(c^{1/4} e \left(2 \sqrt{c} d-\sqrt{c d^2+a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}+\sqrt{2} c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(\sqrt{2} \left(c d^2+a e^2\right)^{3/2} \sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}\right)-\left(c^{1/4} e \left(2 \sqrt{c} d+\sqrt{c d^2+a e^2}\right) \text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2} c^{1/4} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c} (d+e x)\right]\right) \Big/ \left(2 \sqrt{2} \left(c d^2+a e^2\right)^{3/2} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}\right)+\left(c^{1/4} e \left(2 \sqrt{c} d+\sqrt{c d^2+a e^2}\right) \text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2} c^{1/4} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c} (d+e x)\right]\right) \Big/ \left(2 \sqrt{2} \left(c d^2+a e^2\right)^{3/2} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 209 leaves):

$$\frac{1}{c d^2+a e^2}\left(-\frac{2 e}{\sqrt{d+e x}}+\frac{\sqrt{c} \left(-i \sqrt{c} d+\sqrt{a} e\right) \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{d+e x}}{\sqrt{c d-i \sqrt{a} \sqrt{c} e}}\right]}{\sqrt{a} \sqrt{c d-i \sqrt{a} \sqrt{c} e}}+\frac{\sqrt{c} \left(i \sqrt{c} d+\sqrt{a} e\right) \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{d+e x}}{\sqrt{c d+i \sqrt{a} \sqrt{c} e}}\right]}{\sqrt{a} \sqrt{c d+i \sqrt{a} \sqrt{c} e}}\right)$$

Problem 623: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 736 leaves, 12 steps):

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

$$\left(\sqrt{2}\left(c d^2+a e^2\right)^{5/2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

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

$$\left(\sqrt{2}\left(c d^2+a e^2\right)^{5/2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-\left(c^{3/4} e\left(3 c d^2-a e^2+2\sqrt{c}\, d\sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\left(d+e x\right)\right]\right)\Big/$$

$$\left(2\sqrt{2}\left(c d^2+a e^2\right)^{5/2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+\left(c^{3/4} e\left(3 c d^2-a e^2+2\sqrt{c}\, d\sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\left(d+e x\right)\right]\right)\Big/$$

$$\left(2\sqrt{2}\left(c d^2+a e^2\right)^{5/2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 229 leaves) :

$$-\frac{2e\left(a e^2+c d\left(7 d+6 e x\right)\right)}{3\left(c d^2+a e^2\right)^2\left(d+e x\right)^{3/2}}-\frac{i\, c\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}\right]}{\sqrt{a}\left(\sqrt{c}\, d-i\sqrt{a}\, e\right)^2\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}+$$

$$\frac{i\, c\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}\right]}{\sqrt{a}\left(\sqrt{c}\, d+i\sqrt{a}\, e\right)^2\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}$$

Problem 631: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(d+e x\right)^{7/2}}{\left(a+c x^2\right)^2}\,dx$$

Optimal (type 3, 887 leaves, 13 steps) :

$$-\frac{e\left(c d^2-5 a e^2\right)\sqrt{d+e x}}{2 a c^2}-\frac{d e\left(d+e x\right)^{3/2}}{2 a c}-\frac{\left(a e-c d x\right)\left(d+e x\right)^{5/2}}{2 a c\left(a+c x^2\right)}+$$

$$\left(e\left(c^2 d^4-4 a c d^2 e^2-5 a^2 e^4+\sqrt{c}\, d\sqrt{c d^2+a e^2}\left(c d^2+13 a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}-\sqrt{2}\, c^{1/4}\sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(4\sqrt{2}\, a c^{9/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(e\left(c^2 d^4-4 a c d^2 e^2-5 a^2 e^4+\sqrt{c}\, d\sqrt{c d^2+a e^2}\left(c d^2+13 a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}+\sqrt{2}\, c^{1/4}\sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(4\sqrt{2}\, a c^{9/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(e\left(c^2 d^4-4 a c d^2 e^2-5 a^2 e^4-\sqrt{c}\, d\sqrt{c d^2+a e^2}\left(c d^2+13 a e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\left(d+e x\right)\right]\right)\Big/$$

$$\left(8\sqrt{2}\, a c^{9/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+$$

$$\left(e\left(c^2 d^4-4 a c d^2 e^2-5 a^2 e^4-\sqrt{c}\, d\sqrt{c d^2+a e^2}\left(c d^2+13 a e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\left(d+e x\right)\right]\right)\Big/$$

$$\left(8\sqrt{2}\, a c^{9/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 282 leaves) :

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

$$\frac{\left(\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e\right)^3\,\left(-2\,\mathrm{i}\,\sqrt{c}\,d+5\,\sqrt{a}\,e\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}+$$

$$\left.\frac{\left(\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e\right)^3\,\left(2\,\mathrm{i}\,\sqrt{c}\,d+5\,\sqrt{a}\,e\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 632: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^{5/2}}{\left(a+c\,x^2\right)^2}\,dx$$

Optimal (type 3, 811 leaves, 12 steps):

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

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\,\,-\sqrt{2}\,\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Bigg/$$

$$\left(4\,\sqrt{2}\,\,a\,c^{7/4}\,\sqrt{c\,d^2+a\,e^2}\,\,\sqrt{\sqrt{c}\,\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

$$\left(e\,\left(c^{3/2}\,d^3+a\,\sqrt{c}\,\,d\,e^2+\sqrt{c\,d^2+a\,e^2}\,\,\left(c\,d^2+3\,a\,e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\,\,+\sqrt{2}\,\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Bigg/$$

$$\left(4\,\sqrt{2}\,\,a\,c^{7/4}\,\sqrt{c\,d^2+a\,e^2}\,\,\sqrt{\sqrt{c}\,\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

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

$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}\,\,-\sqrt{2}\,\,c^{1/4}\,\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\,\,\sqrt{d+e\,x}\,+\sqrt{c}\,\,\left(d+e\,x\right)\right]\right)\Bigg/$$

$$\left(8\,\sqrt{2}\,\,a\,c^{7/4}\,\sqrt{c\,d^2+a\,e^2}\,\,\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\right)+$$

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

$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}\,\,+\sqrt{2}\,\,c^{1/4}\,\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\,\,\sqrt{d+e\,x}\,+\sqrt{c}\,\,\left(d+e\,x\right)\right]\right)\Bigg/$$

$$\left(8\,\sqrt{2}\,\,a\,c^{7/4}\,\sqrt{c\,d^2+a\,e^2}\,\,\sqrt{\sqrt{c}\,\,d+\sqrt{c\,d^2+a\,e^2}}\right)$$

Result (type 3, 271 leaves) :

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

$$\left(\sqrt{c}\,\left(\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e\right)^2\,\left(-2\,\mathrm{i}\,\sqrt{c}\,d+3\,\sqrt{a}\,e\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]\right)\Big/$$

$$\left.\left(\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}\right)+\frac{\sqrt{c}\,\left(\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e\right)^2\,\left(2\,\mathrm{i}\,\sqrt{c}\,d+3\,\sqrt{a}\,e\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 633: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 726 leaves, 11 steps):

$$-\frac{(a e - c d x)\sqrt{d+e x}}{2 a c (a + c x^2)} + \left(e \left(c d^2 + a e^2 + \sqrt{c}\, d \sqrt{c d^2 + a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}} - \sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d - \sqrt{c d^2 + a e^2}}}\right]\right) \Big/ \left(4 \sqrt{2}\, a c^{5/4} \sqrt{c d^2 + a e^2} \sqrt{\sqrt{c}\, d - \sqrt{c d^2 + a e^2}}\right) - \left(e \left(c d^2 + a e^2 + \sqrt{c}\, d \sqrt{c d^2 + a e^2}\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}} + \sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d - \sqrt{c d^2 + a e^2}}}\right]\right) \Big/ \left(4 \sqrt{2}\, a c^{5/4} \sqrt{c d^2 + a e^2} \sqrt{\sqrt{c}\, d - \sqrt{c d^2 + a e^2}}\right) - \left(e \left(c d^2 + a e^2 - \sqrt{c}\, d \sqrt{c d^2 + a e^2}\right) \text{Log}\left[\sqrt{c d^2 + a e^2} - \sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}} \sqrt{d+e x} + \sqrt{c}\, (d+e x)\right]\right) \Big/ \left(8 \sqrt{2}\, a c^{5/4} \sqrt{c d^2 + a e^2} \sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}}\right) + \left(e \left(c d^2 + a e^2 - \sqrt{c}\, d \sqrt{c d^2 + a e^2}\right) \text{Log}\left[\sqrt{c d^2 + a e^2} + \sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}} \sqrt{d+e x} + \sqrt{c}\, (d+e x)\right]\right) \Big/ \left(8 \sqrt{2}\, a c^{5/4} \sqrt{c d^2 + a e^2} \sqrt{\sqrt{c}\, d + \sqrt{c d^2 + a e^2}}\right)$$

Result (type 3, 235 leaves):

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

Problem 634: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d+e x}}{\left(a + c x^2\right)^2} \, dx$$

Optimal (type 3, 675 leaves, 11 steps):

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

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

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(8\sqrt{2}\, a c^{1/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+\left(e\left(d-\frac{\sqrt{c d^2+a e^2}}{\sqrt{c}}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(8\sqrt{2}\, a c^{1/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 208 leaves):

$$\frac{1}{4 a^{3/2}}\left(\frac{2\sqrt{a}\, x\sqrt{d+e x}}{a+c x^2}-\frac{\left(2 i c d+\sqrt{a}\sqrt{c}\, e\right) \text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}\right]}{c\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}-\right.$$

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

Problem 635: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{d+e x}\left(a+c x^2\right)^2}\, dx$$

Optimal (type 3, 739 leaves, 11 steps):

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

Result (type 3, 245 leaves):

$$\left(\frac{2\sqrt{a}\,(a e+c d x)\sqrt{d+e x}}{a+c x^2}-\frac{\left(2\, i\, c d^2+\sqrt{a}\sqrt{c}\, d e+3\, i\, a e^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}\right]}{\sqrt{c d-i\sqrt{a}\sqrt{c}\, e}}+\right.$$
$$\left.\frac{i\left(2 c d^2+i\sqrt{a}\sqrt{c}\, d e+3 a e^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}\right]}{\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}\right)\Big/\left(4 a^{3/2}\left(c d^2+a e^2\right)\right)$$

Problem 636: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 845 leaves, 12 steps):

$$\frac{e\left(c d^2-5 a e^2\right)}{2 a\left(c d^2+a e^2\right)^2 \sqrt{d+e x}}+\frac{a e+c d x}{2 a\left(c d^2+a e^2\right) \sqrt{d+e x}\left(a+c x^2\right)}+$$

$$\left(c^{1/4} e\left(c^{3/2} d^3+13 a \sqrt{c} d e^2+\left(c d^2-5 a e^2\right) \sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}-\sqrt{2} c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(4 \sqrt{2} a\left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(c^{1/4} e\left(c^{3/2} d^3+13 a \sqrt{c} d e^2+\left(c d^2-5 a e^2\right) \sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}+\sqrt{2} c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(4 \sqrt{2} a\left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c} d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(c^{1/4} e\left(c^{3/2} d^3+13 a \sqrt{c} d e^2-\left(c d^2-5 a e^2\right) \sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2} c^{1/4} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}(d+e x)\right]\right)\Big/$$

$$\left(8 \sqrt{2} a\left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}\right)+$$

$$\left(c^{1/4} e\left(c^{3/2} d^3+13 a \sqrt{c} d e^2-\left(c d^2-5 a e^2\right) \sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2} c^{1/4} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}(d+e x)\right]\right)\Big/$$

$$\left(8 \sqrt{2} a\left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c} d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 312 leaves) :

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

$$\frac{i\sqrt{c}\,\left(2\sqrt{c}\,d-5\,i\sqrt{a}\,e\right)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-i\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d-i\sqrt{a}\,e\right)^2\sqrt{c\,d-i\sqrt{a}\,\sqrt{c}\,e}}+$$

$$\left.\frac{i\sqrt{c}\,\left(2\sqrt{c}\,d+5\,i\sqrt{a}\,e\right)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+i\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d+i\sqrt{a}\,e\right)^2\sqrt{c\,d+i\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 637: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 930 leaves, 13 steps):

$$\frac{e\left(3\,c\,d^2-7\,a\,e^2\right)}{6\,a\left(c\,d^2+a\,e^2\right)^2(d+e\,x)^{3/2}}+\frac{c\,d\,e\left(c\,d^2-19\,a\,e^2\right)}{2\,a\left(c\,d^2+a\,e^2\right)^3\sqrt{d+e\,x}}+\frac{a\,e+c\,d\,x}{2\,a\left(c\,d^2+a\,e^2\right)(d+e\,x)^{3/2}\left(a+c\,x^2\right)}+$$

$$\left(c^{3/4}\,e\left(c^2\,d^4+34\,a\,c\,d^2\,e^2-7\,a^2\,e^4+\sqrt{c}\,d\left(c\,d^2-19\,a\,e^2\right)\sqrt{c\,d^2+a\,e^2}\right)\right.$$
$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}-\sqrt{2}\,c^{1/4}\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Big/$$
$$\left(4\sqrt{2}\,a\left(c\,d^2+a\,e^2\right)^{7/2}\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

$$\left(c^{3/4}\,e\left(c^2\,d^4+34\,a\,c\,d^2\,e^2-7\,a^2\,e^4+\sqrt{c}\,d\left(c\,d^2-19\,a\,e^2\right)\sqrt{c\,d^2+a\,e^2}\right)\right.$$
$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}+\sqrt{2}\,c^{1/4}\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Big/$$
$$\left(4\sqrt{2}\,a\left(c\,d^2+a\,e^2\right)^{7/2}\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

$$\left(c^{3/4}\,e\left(c^2\,d^4+34\,a\,c\,d^2\,e^2-7\,a^2\,e^4-\sqrt{c}\,d\left(c\,d^2-19\,a\,e^2\right)\sqrt{c\,d^2+a\,e^2}\right)\right.$$
$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}-\sqrt{2}\,c^{1/4}\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,(d+e\,x)\right]\right)\Big/$$
$$\left(8\sqrt{2}\,a\left(c\,d^2+a\,e^2\right)^{7/2}\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)+$$

$$\left(c^{3/4}\,e\left(c^2\,d^4+34\,a\,c\,d^2\,e^2-7\,a^2\,e^4-\sqrt{c}\,d\left(c\,d^2-19\,a\,e^2\right)\sqrt{c\,d^2+a\,e^2}\right)\right.$$
$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}+\sqrt{2}\,c^{1/4}\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,(d+e\,x)\right]\right)\Big/$$
$$\left(8\sqrt{2}\,a\left(c\,d^2+a\,e^2\right)^{7/2}\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)$$

Result (type 3, 349 leaves) :

$$\frac{1}{12\,a^{3/2}}\left(-\left(\left(2\sqrt{a}\left(4\,a^3\,e^5-3\,c^3\,d^3\,x\,(d+e\,x)^2+a^2\,c\,e^3\left(55\,d^2+54\,d\,e\,x+7\,e^2\,x^2\right)+a\,c^2\,d\,e\left(-9\,d^3-9\,d^2\,e\,x+61\,d\,e^2\,x^2+57\,e^3\,x^3\right)\right)\right)\Big/\left(\left(c\,d^2+a\,e^2\right)^3\,(d+e\,x)^{3/2}\,\left(a+c\,x^2\right)\right)\right)-\frac{3\,\mathrm{i}\,c\left(2\sqrt{c}\,d-7\,\mathrm{i}\sqrt{a}\,e\right)\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d-\mathrm{i}\sqrt{a}\,e\right)^3\sqrt{c\,d-\mathrm{i}\sqrt{a}\,\sqrt{c}\,e}}+\frac{3\,\mathrm{i}\,c\left(2\sqrt{c}\,d+7\,\mathrm{i}\sqrt{a}\,e\right)\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+\mathrm{i}\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d+\mathrm{i}\sqrt{a}\,e\right)^3\sqrt{c\,d+\mathrm{i}\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 643: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 905 leaves, 12 steps):

$$-\frac{(a e-c d x)(d+e x)^{5/2}}{4 a c\left(a+c x^2\right)^2}-\frac{\sqrt{d+e x}\left(a e\left(7 c d^2+5 a e^2\right)-2 c d\left(3 c d^2+2 a e^2\right) x\right)}{16 a^2 c^2\left(a+c x^2\right)}+$$

$$\left(e\left(6 c^2 d^4+11 a c d^2 e^2+5 a^2 e^4+\sqrt{c}\, d \sqrt{c d^2+a e^2}\left(6 c d^2+8 a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}-\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(32 \sqrt{2}\, a^2 c^{9/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(e\left(6 c^2 d^4+11 a c d^2 e^2+5 a^2 e^4+\sqrt{c}\, d \sqrt{c d^2+a e^2}\left(6 c d^2+8 a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}+\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(32 \sqrt{2}\, a^2 c^{9/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(e\left(6 c^2 d^4+11 a c d^2 e^2+5 a^2 e^4-2 \sqrt{c}\, d \sqrt{c d^2+a e^2}\left(3 c d^2+4 a e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64 \sqrt{2}\, a^2 c^{9/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+$$

$$\left(e\left(6 c^2 d^4+11 a c d^2 e^2+5 a^2 e^4-2 \sqrt{c}\, d \sqrt{c d^2+a e^2}\left(3 c d^2+4 a e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64 \sqrt{2}\, a^2 c^{9/4} \sqrt{c d^2+a e^2} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 337 leaves) :

$$\frac{1}{32\,a^{5/2}\,c^2}\left(\frac{1}{\left(a+c\,x^2\right)^2}2\,\sqrt{a}\,\sqrt{d+e\,x}\left(-5\,a^3\,e^3+6\,c^3\,d^3\,x^3+a\,c^2\,d\,x\left(10\,d^2+d\,e\,x+8\,e^2\,x^2\right)-a^2\,c\,e\left(11\,d^2+4\,d\,e\,x+9\,e^2\,x^2\right)\right)+\left(\left(\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e\right)^2\left(-12\,\mathrm{i}\,c\,d^2+18\,\sqrt{a}\,\sqrt{c}\,d\,e+5\,\mathrm{i}\,a\,e^2\right)\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]\right)\Big/\left(\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}\right)+\left(\left(\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e\right)^2\left(12\,\mathrm{i}\,c\,d^2+18\,\sqrt{a}\,\sqrt{c}\,d\,e-5\,\mathrm{i}\,a\,e^2\right)\mathrm{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]\right)\Big/\left(\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}\right)\right)$$

Problem 644: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 846 leaves, 12 steps):

$$-\frac{(a e-c d x)\,(d+e x)^{3/2}}{4 a c\,(a+c x^2)^2}-\frac{3\sqrt{d+e x}\,\left(a d e-\left(2 c d^2+a e^2\right) x\right)}{16 a^2 c\,(a+c x^2)}+$$

$$\left(3 e\left(2 c^{3/2} d^3+2 a\sqrt{c}\, d e^2+\sqrt{c d^2+a e^2}\,\left(2 c d^2+a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}-\sqrt{2}\, c^{1/4}\sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(32\sqrt{2}\, a^2 c^{7/4}\sqrt{c d^2+a e^2}\,\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

$$\left(3 e\left(2 c^{3/2} d^3+2 a\sqrt{c}\, d e^2+\sqrt{c d^2+a e^2}\,\left(2 c d^2+a e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}+\sqrt{2}\, c^{1/4}\sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right)\Big/$$

$$\left(32\sqrt{2}\, a^2 c^{7/4}\sqrt{c d^2+a e^2}\,\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

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

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\,\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64\sqrt{2}\, a^2 c^{7/4}\sqrt{c d^2+a e^2}\,\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+$$

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

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\,\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64\sqrt{2}\, a^2 c^{7/4}\sqrt{c d^2+a e^2}\,\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 311 leaves) :

$$\frac{1}{32\,a^{5/2}\,c^2}\left(\frac{1}{\left(a+c\,x^2\right)^2}2\,\sqrt{a}\;c\,\sqrt{d+e\,x}\;\left(6\,c^2\,d^2\,x^3-a^2\,e\,\left(7\,d+e\,x\right)+a\,c\,x\,\left(10\,d^2+d\,e\,x+3\,e^2\,x^2\right)\right)-\right.$$

$$\left(3\,\left(4\,\mathrm{i}\,c^2\,d^3+2\,\sqrt{a}\;c^{3/2}\,d^2\,e+3\,\mathrm{i}\,a\,c\,d\,e^2+a^{3/2}\,\sqrt{c}\;e^3\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c}\;\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\;\sqrt{c}\;e}}\right]\right)\Big/$$

$$\left(\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\;\sqrt{c}\;e}\right)+$$

$$\left.3\,\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\;\sqrt{c}\;e}\;\left(4\,\mathrm{i}\,c\,d^2+2\,\sqrt{a}\;\sqrt{c}\;d\,e+\mathrm{i}\,a\,e^2\right)\,\mathrm{ArcTanh}\left[\frac{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\;\sqrt{c}\;e}\;\sqrt{d+e\,x}}{\sqrt{c}\;d+\mathrm{i}\,\sqrt{a}\;e}\right]\right)$$

Problem 645: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 769 leaves, 12 steps):

$$-\frac{(a e-c d x)\sqrt{d+e x}}{4 a c\left(a+c x^2\right)^2}+\frac{(a e+6 c d x)\sqrt{d+e x}}{16 a^2 c\left(a+c x^2\right)}+$$

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

$$\left(32\sqrt{2}\, a^2 c^{5/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-$$

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

$$\left(32\sqrt{2}\, a^2 c^{5/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right)-\left(3 e\left(2 c d^2+a e^2-2\sqrt{c}\, d\sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64\sqrt{2}\, a^2 c^{5/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)+\left(3 e\left(2 c d^2+a e^2-2\sqrt{c}\, d\sqrt{c d^2+a e^2}\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\sqrt{d+e x}+\sqrt{c}\,(d+e x)\right]\right)\Big/$$

$$\left(64\sqrt{2}\, a^2 c^{5/4}\sqrt{c d^2+a e^2}\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 253 leaves):

$$\frac{1}{32 a^{5/2} c}\left(\frac{2\sqrt{a}\sqrt{d+e x}\left(-3 a^2 e+6 c^2 d x^3+a c x(10 d+e x)\right)}{\left(a+c x^2\right)^2}-\right.$$

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

$$\left.\frac{3 i\left(4 c d^2+2 i\sqrt{a}\sqrt{c}\, d e+a e^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{d+e x}}{\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}\right]}{\sqrt{c d+i\sqrt{a}\sqrt{c}\, e}}\right)$$

Problem 646: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d+e\,x}}{\left(a+c\,x^2\right)^3}\,dx$$

Optimal (type 3, 849 leaves, 12 steps) :

$$\frac{x\sqrt{d+e\,x}}{4\,a\,\left(a+c\,x^2\right)^2}+\frac{\sqrt{d+e\,x}\,\left(a\,d\,e+\left(6\,c\,d^2+5\,a\,e^2\right)\,x\right)}{16\,a^2\,\left(c\,d^2+a\,e^2\right)\,\left(a+c\,x^2\right)}+$$

$$\left(e\,\left(6\,c^{3/2}\,d^3+8\,a\,\sqrt{c}\,d\,e^2+\sqrt{c\,d^2+a\,e^2}\,\left(6\,c\,d^2+5\,a\,e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}-\sqrt{2}\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Big/$$

$$\left(32\,\sqrt{2}\,a^2\,c^{3/4}\,\left(c\,d^2+a\,e^2\right)^{3/2}\,\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

$$\left(e\,\left(6\,c^{3/2}\,d^3+8\,a\,\sqrt{c}\,d\,e^2+\sqrt{c\,d^2+a\,e^2}\,\left(6\,c\,d^2+5\,a\,e^2\right)\right)\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}+\sqrt{2}\,c^{1/4}\,\sqrt{d+e\,x}}{\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}}\right]\right)\Big/$$

$$\left(32\,\sqrt{2}\,a^2\,c^{3/4}\,\left(c\,d^2+a\,e^2\right)^{3/2}\,\sqrt{\sqrt{c}\,d-\sqrt{c\,d^2+a\,e^2}}\right)-$$

$$\left(e\,\left(6\,c^{3/2}\,d^3+8\,a\,\sqrt{c}\,d\,e^2-\sqrt{c\,d^2+a\,e^2}\,\left(6\,c\,d^2+5\,a\,e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}-\sqrt{2}\,c^{1/4}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,\left(d+e\,x\right)\right]\right)\Big/$$

$$\left(64\,\sqrt{2}\,a^2\,c^{3/4}\,\left(c\,d^2+a\,e^2\right)^{3/2}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)+$$

$$\left(e\,\left(6\,c^{3/2}\,d^3+8\,a\,\sqrt{c}\,d\,e^2-\sqrt{c\,d^2+a\,e^2}\,\left(6\,c\,d^2+5\,a\,e^2\right)\right)\right.$$

$$\left.\text{Log}\left[\sqrt{c\,d^2+a\,e^2}+\sqrt{2}\,c^{1/4}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\,\sqrt{d+e\,x}+\sqrt{c}\,\left(d+e\,x\right)\right]\right)\Big/$$

$$\left(64\,\sqrt{2}\,a^2\,c^{3/4}\,\left(c\,d^2+a\,e^2\right)^{3/2}\,\sqrt{\sqrt{c}\,d+\sqrt{c\,d^2+a\,e^2}}\right)$$

Result (type 3, 318 leaves) :

$$\frac{1}{32\,a^{5/2}}\left(\frac{2\sqrt{a}\,\sqrt{d+e\,x}\,\left(4\,a\,x+\frac{\left(a+c\,x^2\right)\,\left(6\,c\,d^2\,x+a\,e\,\left(d+5\,e\,x\right)\right)}{c\,d^2+a\,e^2}\right)}{\left(a+c\,x^2\right)^2}-\right.$$

$$\frac{\mathrm{i}\,\left(12\,c\,d^2-18\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d\,e-5\,a\,e^2\right)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]}{\sqrt{c}\,\left(\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e\right)\,\sqrt{c\,d-\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}+$$

$$\left.\frac{\mathrm{i}\,\left(12\,c\,d^2+18\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d\,e-5\,a\,e^2\right)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right]}{\sqrt{c}\,\left(\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e\right)\,\sqrt{c\,d+\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 647: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^3}\,dx$$

Optimal (type 3, 920 leaves, 12 steps):

$$\frac{(a e+c d x) \sqrt{d+e x}}{4 a \left(c d^2+a e^2\right) \left(a+c x^2\right)^2}+\frac{\sqrt{d+e x} \left(a e \left(c d^2+7 a e^2\right)+6 c d \left(c d^2+2 a e^2\right) x\right)}{16 a^2 \left(c d^2+a e^2\right)^2 \left(a+c x^2\right)}+$$

$$\left(3 e \left(2 c^2 d^4+5 a c d^2 e^2+7 a^2 e^4+2 \sqrt{c}\, d \sqrt{c d^2+a e^2} \left(c d^2+2 a e^2\right)\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}-\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(32 \sqrt{2}\, a^2 c^{1/4} \left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right) -$$

$$\left(3 e \left(2 c^2 d^4+5 a c d^2 e^2+7 a^2 e^4+2 \sqrt{c}\, d \sqrt{c d^2+a e^2} \left(c d^2+2 a e^2\right)\right) \text{ArcTanh}\left[\frac{\sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}+\sqrt{2}\, c^{1/4} \sqrt{d+e x}}{\sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}}\right]\right) \Big/ \left(32 \sqrt{2}\, a^2 c^{1/4} \left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c}\, d-\sqrt{c d^2+a e^2}}\right) -$$

$$\left(3 e \left(2 c^2 d^4+5 a c d^2 e^2+7 a^2 e^4-2 \sqrt{c}\, d \sqrt{c d^2+a e^2} \left(c d^2+2 a e^2\right)\right) \text{Log}\left[\sqrt{c d^2+a e^2}-\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}\, (d+e x)\right]\right) \Big/ \left(64 \sqrt{2}\, a^2 c^{1/4} \left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right) +$$

$$\left(3 e \left(2 c^2 d^4+5 a c d^2 e^2+7 a^2 e^4-2 \sqrt{c}\, d \sqrt{c d^2+a e^2} \left(c d^2+2 a e^2\right)\right) \text{Log}\left[\sqrt{c d^2+a e^2}+\sqrt{2}\, c^{1/4} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}} \sqrt{d+e x}+\sqrt{c}\, (d+e x)\right]\right) \Big/ \left(64 \sqrt{2}\, a^2 c^{1/4} \left(c d^2+a e^2\right)^{5/2} \sqrt{\sqrt{c}\, d+\sqrt{c d^2+a e^2}}\right)$$

Result (type 3, 348 leaves) :

$$\frac{1}{32\,a^{5/2}}\left(\left(2\sqrt{a}\,\sqrt{d+e\,x}\left(11\,a^3\,e^3+6\,c^3\,d^3\,x^3+a^2\,c\,e\left(5\,d^2+16\,d\,e\,x+7\,e^2\,x^2\right)+a\,c^2\,d\,x\left(10\,d^2+d\,e\,x+12\,e^2\,x^2\right)\right)\right)\Big/\left(\left(c\,d^2+a\,e^2\right)^2\left(a+c\,x^2\right)^2\right)-\frac{3\,i\left(4\,c\,d^2-10\,i\sqrt{a}\,\sqrt{c}\,d\,e-7\,a\,e^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d-i\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d-i\sqrt{a}\,e\right)^2\sqrt{c\,d-i\sqrt{a}\,\sqrt{c}\,e}}+\frac{3\,i\left(4\,c\,d^2+10\,i\sqrt{a}\,\sqrt{c}\,d\,e-7\,a\,e^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{d+e\,x}}{\sqrt{c\,d+i\sqrt{a}\,\sqrt{c}\,e}}\right]}{\left(\sqrt{c}\,d+i\sqrt{a}\,e\right)^2\sqrt{c\,d+i\sqrt{a}\,\sqrt{c}\,e}}\right)$$

Problem 648: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 214 leaves, 10 steps):

$$-\frac{3\,\text{ArcTan}\left[\frac{\sqrt{2\left(2+\sqrt{13}\right)}-2\sqrt{2+3\,x}}{\sqrt{2\left(-2+\sqrt{13}\right)}}\right]}{\sqrt{2\left(-2+\sqrt{13}\right)}}+\frac{3\,\text{ArcTan}\left[\frac{\sqrt{2\left(2+\sqrt{13}\right)}+2\sqrt{2+3\,x}}{\sqrt{2\left(-2+\sqrt{13}\right)}}\right]}{\sqrt{2\left(-2+\sqrt{13}\right)}}+\frac{3\,\text{Log}\left[2+\sqrt{13}+3\,x-\sqrt{2\left(2+\sqrt{13}\right)}\,\sqrt{2+3\,x}\right]}{2\sqrt{2\left(2+\sqrt{13}\right)}}-\frac{3\,\text{Log}\left[2+\sqrt{13}+3\,x+\sqrt{2\left(2+\sqrt{13}\right)}\,\sqrt{2+3\,x}\right]}{2\sqrt{2\left(2+\sqrt{13}\right)}}$$

Result (type 3, 59 leaves):

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

Problem 649: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 316 leaves, 10 steps):

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

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

$$\frac{d\,\text{Log}\left[c+\sqrt{c^2+d^2}+d\,x+\sqrt{2}\,\sqrt{c+\sqrt{c^2+d^2}}\,\sqrt{c+d\,x}\right]}{2\,\sqrt{2}\,\sqrt{c+\sqrt{c^2+d^2}}}$$

Result (type 3, 75 leaves):

$$-\text{i}\,\sqrt{c-\text{i}\,d}\,\text{ArcTanh}\left[\frac{\sqrt{c+d\,x}}{\sqrt{c-\text{i}\,d}}\right]+\text{i}\,\sqrt{c+\text{i}\,d}\,\text{ArcTanh}\left[\frac{\sqrt{c+d\,x}}{\sqrt{c+\text{i}\,d}}\right]$$

Problem 652: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 427 leaves, 10 steps):

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

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

$$\left(2\,\sqrt{2}\,b^{3/4}\,\sqrt{2\,\sqrt{b}+\sqrt{9\,a+4\,b}}\right)-$$

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

$$\left(2\,\sqrt{2}\,b^{3/4}\,\sqrt{2\,\sqrt{b}+\sqrt{9\,a+4\,b}}\right)$$

Result (type 3, 186 leaves):

$$\frac{1}{\sqrt{a}\,\sqrt{b}}$$

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

Problem 654: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 205 leaves, 10 steps):

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

Result (type 3, 51 leaves):

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

Problem 655: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 198 leaves, 10 steps):

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

Result (type 3, 55 leaves):

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

Problem 656: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 272 leaves, 12 steps):

$$\frac{\sqrt{-1+x}\;x}{4\left(1+x^2\right)^2}-\frac{(1-11x)\sqrt{-1+x}}{32\left(1+x^2\right)}-\frac{1}{64}\sqrt{\frac{1}{2}\left(-527+373\sqrt{2}\right)}\;\text{ArcTan}\left[\frac{\sqrt{2\left(-1+\sqrt{2}\right)}-2\sqrt{-1+x}}{\sqrt{2\left(1+\sqrt{2}\right)}}\right]+$$

$$\frac{1}{64}\sqrt{\frac{1}{2}\left(-527+373\sqrt{2}\right)}\;\text{ArcTan}\left[\frac{\sqrt{2\left(-1+\sqrt{2}\right)}+2\sqrt{-1+x}}{\sqrt{2\left(1+\sqrt{2}\right)}}\right]-$$

$$\frac{1}{128}\sqrt{\frac{1}{2}\left(527+373\sqrt{2}\right)}\;\text{Log}\left[1-\sqrt{2}-\sqrt{2\left(-1+\sqrt{2}\right)}\;\sqrt{-1+x}-x\right]+$$

$$\frac{1}{128}\sqrt{\frac{1}{2}\left(527+373\sqrt{2}\right)}\;\text{Log}\left[1-\sqrt{2}+\sqrt{2\left(-1+\sqrt{2}\right)}\;\sqrt{-1+x}-x\right]$$

Result (type 3, 90 leaves):

$$\frac{1}{64}\left(\frac{2\sqrt{-1+x}\;\left(-1+19x-x^2+11x^3\right)}{\left(1+x^2\right)^2}-\right.$$

$$\left.(7-18\,i)\sqrt{1-i}\;\text{ArcTan}\left[\frac{\sqrt{-1+x}}{\sqrt{1-i}}\right]-(7+18\,i)\sqrt{1+i}\;\text{ArcTan}\left[\frac{\sqrt{-1+x}}{\sqrt{1+i}}\right]\right)$$

Problem 657: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 398 leaves, 7 steps):

$$\frac{2\sqrt{d+e\,x}\,\left(3\,c\,d^2-5\,a\,e^2+24\,c\,d\,e\,x\right)\sqrt{a+c\,x^2}}{105\,c\,e}+\frac{2\,e\,\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^{3/2}}{7\,c}+$$

$$\left(4\sqrt{-a}\,d\,\left(3\,c\,d^2-29\,a\,e^2\right)\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(105\sqrt{c}\,e^2\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-$$

$$\left(4\sqrt{-a}\,\left(3\,c\,d^2-5\,a\,e^2\right)\,\left(c\,d^2+a\,e^2\right)\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(105\,c^{3/2}\,e^2\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 582 leaves) :

$$\frac{1}{105\sqrt{a+c x^2}}\sqrt{d+e x}\left(\frac{2\left(a+c x^2\right)\left(10 a e^2+3 c\left(d^2+8 d e x+5 e^2 x^2\right)\right)}{c e}+\frac{1}{c e^3\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(d+e x)}\right.$$

$$4\left(-d e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(-29 a^2 e^2+3 c^2 d^2 x^2+a c\left(3 d^2-29 e^2 x^2\right)\right)+\right.$$

$$\sqrt{c}\,d\left(3 i c^{3/2} d^3-3\sqrt{a}\,c d^2 e-29 i a\sqrt{c}\,d e^2+29 a^{3/2} e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}$$

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

$$\sqrt{a}\,e\left(3 c^{3/2} d^3+27 i\sqrt{a}\,c d^2 e-29 a\sqrt{c}\,d e^2-5 i a^{3/2} e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}$$

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

Problem 658: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{d+e x}\,\sqrt{a+c x^2}\,dx$$

Optimal (type 4, 362 leaves, 7 steps):

$$-\frac{4 d \sqrt{d+e x} \sqrt{a+c x^2}}{15 e}+\frac{2 (d+e x)^{3/2} \sqrt{a+c x^2}}{5 e}+\left(4 \sqrt{-a} \left(c d^2-3 a e^2\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Big/$$

$$\left(15 \sqrt{c} e^2 \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{a+c x^2}\right)-\left(4 \sqrt{-a} d \left(c d^2+a e^2\right) \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Big/\left(15 \sqrt{c} e^2 \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 536 leaves):

$$\frac{1}{15 \sqrt{a+c x^2}}\sqrt{d+e x} \left(\frac{2 (d+3 e x) \left(a+c x^2\right)}{e}-\left(4 \left(e^2 \sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}} \left(-3 a^2 e^2+c^2 d^2 x^2+a c \left(d^2-3 e^2 x^2\right)\right)+\right.\right.\right.$$

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

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

$$\left(c d^2+4 i \sqrt{a} \sqrt{c} d e-3 a e^2\right) \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}} \sqrt{-\frac{\frac{i \sqrt{a} e}{\sqrt{c}}-e x}{d+e x}} (d+e x)^{3/2} \text{EllipticF}\Big[$$

$$\left.\left.\left.i \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c} d-i \sqrt{a} e}{\sqrt{c} d+i \sqrt{a} e}\right]\right)\right)\Big/\left(c e^3 \sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}} (d+e x)\right)\Bigg)$$

Problem 659: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+c x^2}}{\sqrt{d+e x}}\, dx$$

Optimal (type 4, 322 leaves, 6 steps):

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

Result (type 4, 456 leaves):

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

Problem 660: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 305 leaves, 6 steps):

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

Result (type 4, 419 leaves):

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

Problem 661: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+c\,x^2}}{\left(d+e\,x\right)^{5/2}}\,dx$$

Optimal (type 4, 366 leaves, 7 steps):

$$-\frac{2\sqrt{a+c x^2}}{3 e (d+e x)^{3/2}}+\frac{4 c d \sqrt{a+c x^2}}{3 e (c d^2+a e^2)\sqrt{d+e x}}+$$

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

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

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

$$\left(3 e^2\sqrt{d+e x}\sqrt{a+c x^2}\right)$$

Result (type 4, 504 leaves):

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

$$\left(4 c\left(d e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(a+c x^2)+\sqrt{c}\,d\left(-i\sqrt{c}\,d+\sqrt{a}\,e\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}\right.\right.$$

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

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

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\Big/$$

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

Problem 662: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 444 leaves, 8 steps):

$$-\frac{2\sqrt{a+c x^2}}{5 e (d+e x)^{5/2}}+\frac{4 c d \sqrt{a+c x^2}}{15 e \left(c d^2+a e^2\right) (d+e x)^{3/2}}+\frac{4 c \left(c d^2-3 a e^2\right) \sqrt{a+c x^2}}{15 e \left(c d^2+a e^2\right)^2 \sqrt{d+e x}}+\left(4 \sqrt{-a}\, c^{3/2} \left(c d^2-3 a e^2\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right) \Bigg/ \left(15 e^2 \left(c d^2+a e^2\right)^2 \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{a+c x^2}\right)-\left(4 \sqrt{-a}\, c^{3/2} d \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right) \Bigg/ \left(15 e^2 \left(c d^2+a e^2\right) \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 602 leaves):

$$\frac{1}{15\,e^3\left(c\,d^2+a\,e^2\right)^2\left(d+e\,x\right)^{5/2}\sqrt{a+c\,x^2}}$$

$$2\left(-e^2\left(a+c\,x^2\right)\left(3\,a^2\,e^4-c^2\,d^2\left(d^2+6\,d\,e\,x+2\,e^2\,x^2\right)+2\,a\,c\,e^2\left(5\,d^2+5\,d\,e\,x+3\,e^2\,x^2\right)\right)+\right.$$

$$\frac{1}{\sqrt{-d-\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}}}\,2\,c\left(d+e\,x\right)^2\left(-e^2\sqrt{-d-\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}}\left(-3\,a^2\,e^2+c^2\,d^2\,x^2+a\,c\left(d^2-3\,e^2\,x^2\right)\right)+\right.$$

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

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

$$\sqrt{a}\sqrt{c}\,e\left(c\,d^2+4\,\mathrm{i}\sqrt{a}\sqrt{c}\,d\,e-3\,a\,e^2\right)\sqrt{\frac{e\left(\frac{\mathrm{i}\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}$$

$$\left.\left.\left(d+e\,x\right)^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-\mathrm{i}\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\sqrt{a}\,e}\right]\right)\right)$$

Problem 663: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 497 leaves, 8 steps):

$$\frac{1}{1155\, c\, e^3} 4 \sqrt{d+e x}\, \left(4 c^2 d^4+21 a c d^2 e^2-15 a^2 e^4-3 c d e \left(c d^2-31 a e^2\right) x\right) \sqrt{a+c x^2}\, + \frac{2 \sqrt{d+e x}\, \left(c d^2-3 a e^2+28 c d e x\right) \left(a+c x^2\right)^{3/2}}{231\, c\, e}+\frac{2 e \sqrt{d+e x}\, \left(a+c x^2\right)^{5/2}}{11\, c}+ \left(32 \sqrt{-a}\, d \left(c d^2-3 a e^2\right) \left(c d^2+9 a e^2\right) \sqrt{d+e x}\, \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a}\, \sqrt{c}\, d-a e}\right]\right) \bigg/ \left(1155 \sqrt{c}\, e^4 \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}}\, \sqrt{a+c x^2}\right) - \left(8 \sqrt{-a}\, \left(c d^2+a e^2\right) \left(4 c^2 d^4+21 a c d^2 e^2-15 a^2 e^4\right) \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}}\, \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a}\, \sqrt{c}\, d-a e}\right]\right) \bigg/ \left(1155\, c^{3/2} e^4 \sqrt{d+e x}\, \sqrt{a+c x^2}\right)$$

Result (type 4, 695 leaves) :

$$\frac{1}{1155\, c\, e^5 \sqrt{a + c x^2}} 2 \sqrt{d + e x} \left(e^2 \left(a + c x^2\right) \left(60 a^2 e^4 + a c e^2 \left(47 d^2 + 326 d e x + 195 e^2 x^2\right) + c^2 \left(8 d^4 - 6 d^3 e x + 5 d^2 e^2 x^2 + 140 d e^3 x^3 + 105 e^4 x^4\right)\right) + \frac{1}{\sqrt{-d - \frac{i \sqrt{a}\, e}{\sqrt{c}}} \left(d + e x\right)} 4 \left(-4 d e^2 \sqrt{-d - \frac{i \sqrt{a}\, e}{\sqrt{c}}} \left(c^2 d^4 + 6 a c d^2 e^2 - 27 a^2 e^4\right) \left(a + c x^2\right) + 4 \sqrt{c}\, d \left(i c^{5/2} d^5 - \sqrt{a}\, c^2 d^4 e + 6 i a c^{3/2} d^3 e^2 - 6 a^{3/2} c d^2 e^3 - 27 i a^2 \sqrt{c}\, d e^4 + 27 a^{5/2} e^5\right) \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}} + x\right)}{d + e x}} \sqrt{-\frac{\frac{i \sqrt{a}\, e}{\sqrt{c}} - e x}{d + e x}} \left(d + e x\right)^{3/2} \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d - \frac{i \sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d + e x}}\right], \frac{\sqrt{c}\, d - i \sqrt{a}\, e}{\sqrt{c}\, d + i \sqrt{a}\, e}\right] + \sqrt{a}\, e \left(4 c^{5/2} d^5 + i \sqrt{a}\, c^2 d^4 e + 24 a c^{3/2} d^3 e^2 + 114 i a^{3/2} c d^2 e^3 - 108 a^2 \sqrt{c}\, d e^4 - 15 i a^{5/2} e^5\right) \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}} + x\right)}{d + e x}} \sqrt{-\frac{\frac{i \sqrt{a}\, e}{\sqrt{c}} - e x}{d + e x}} \left(d + e x\right)^{3/2} \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d - \frac{i \sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d + e x}}\right], \frac{\sqrt{c}\, d - i \sqrt{a}\, e}{\sqrt{c}\, d + i \sqrt{a}\, e}\right]\right)\right)$$

Problem 664: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 448 leaves, 8 steps):

$$\frac{4\sqrt{d+e\,x}\,\left(4\,d\,\left(c\,d^2+3\,a\,e^2\right)-3\,e\,\left(c\,d^2-7\,a\,e^2\right)\,x\right)\,\sqrt{a+c\,x^2}}{315\,e^3}-$$

$$\frac{4\,d\,\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^{3/2}}{21\,e}+\frac{2\,\left(d+e\,x\right)^{3/2}\,\left(a+c\,x^2\right)^{3/2}}{9\,e}+$$

$$\left(8\,\sqrt{-a}\,\left(4\,c^2\,d^4+15\,a\,c\,d^2\,e^2-21\,a^2\,e^4\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/\left(315\,\sqrt{c}\,e^4\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-$$

$$\left(32\,\sqrt{-a}\,d\,\left(c\,d^2+a\,e^2\right)\,\left(c\,d^2+3\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/\left(315\,\sqrt{c}\,e^4\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 646 leaves) :

$$\frac{1}{315\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{1}{e^3}2\left(a+c\,x^2\right)\left(a\,e^2\left(29\,d+77\,e\,x\right)+c\left(8\,d^3-6\,d^2\,e\,x+5\,d\,e^2\,x^2+35\,e^3\,x^3\right)\right)+\right.$$

$$\frac{1}{c\,e^5\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(d+e\,x\right)}8\left(-e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(4\,c^2\,d^4+15\,a\,c\,d^2\,e^2-21\,a^2\,e^4\right)\left(a+c\,x^2\right)+\right.$$

$$\sqrt{c}\left(4\,i\,c^{5/2}\,d^5-4\sqrt{a}\,c^2\,d^4\,e+15\,i\,a\,c^{3/2}\,d^3\,e^2-15\,a^{3/2}\,c\,d^2\,e^3-21\,i\,a^2\sqrt{c}\,d\,e^4+21\,a^{5/2}\,e^5\right)$$

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

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+\sqrt{a}\sqrt{c}\,e$$

$$\left(4\,c^2\,d^4+i\sqrt{a}\,c^{3/2}\,d^3\,e+15\,a\,c\,d^2\,e^2+33\,i\,a^{3/2}\sqrt{c}\,d\,e^3-21\,a^2\,e^4\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 665: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 393 leaves, 7 steps):

$$\frac{4\sqrt{d+e\,x}\,\left(4\,c\,d^2+5\,a\,e^2-3\,c\,d\,e\,x\right)\sqrt{a+c\,x^2}}{35\,e^3}+$$

$$\frac{2\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^{3/2}}{7\,e}+\left(32\sqrt{-a}\,\sqrt{c}\,d\,\left(c\,d^2+2\,a\,e^2\right)\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(35\,e^4\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-$$

$$\left(8\sqrt{-a}\,\left(c\,d^2+a\,e^2\right)\,\left(4\,c\,d^2+5\,a\,e^2\right)\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(35\sqrt{c}\,e^4\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 575 leaves) :

$$\frac{1}{35\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{2\left(a+c\,x^2\right)\left(15\,a\,e^2+c\left(8\,d^2-6\,d\,e\,x+5\,e^2\,x^2\right)\right)}{e^3}-\right.$$

$$\frac{1}{e^5\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(d+e\,x\right)}\,8\left(4\,d\,e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(2\,a^2\,e^2+c^2\,d^2\,x^2+a\,c\left(d^2+2\,e^2\,x^2\right)\right)+\right.$$

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

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

$$\sqrt{a}\,e\left(4\,c^{3/2}\,d^3+i\sqrt{a}\,c\,d^2\,e+8\,a\sqrt{c}\,d\,e^2+5\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 666: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 369 leaves, 7 steps):

$$-\frac{4\,c\,(4\,d-3\,e\,x)\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}}{5\,e^3}-\frac{2\,(a+c\,x^2)^{3/2}}{e\,\sqrt{d+e\,x}}-\left(8\,\sqrt{-a}\,\sqrt{c}\,(4\,c\,d^2+3\,a\,e^2)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(5\,e^4\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)+$$

$$\left(32\,\sqrt{-a}\,\sqrt{c}\,d\,(c\,d^2+a\,e^2)\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(5\,e^4\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 565 leaves) :

$$\frac{2\sqrt{a+c\,x^2}\,\left(-5\,a\,e^2+c\,\left(-8\,d^2-2\,d\,e\,x+e^2\,x^2\right)\right)}{5\,e^3\,\sqrt{d+e\,x}}+\frac{1}{5\,e^5\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}}$$

$$8\left(e^2\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(3\,a^2\,e^2+4\,c^2\,d^2\,x^2+a\,c\,\left(4\,d^2+3\,e^2\,x^2\right)\right)+\right.$$

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

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

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

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

Problem 667: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 358 leaves, 7 steps) :

$$\frac{4\,c\,(4\,d+e\,x)\,\sqrt{a+c\,x^2}}{3\,e^3\,\sqrt{d+e\,x}}-\frac{2\,\left(a+c\,x^2\right)^{3/2}}{3\,e\,(d+e\,x)^{3/2}}+\left(32\,\sqrt{-a}\,c^{3/2}\,d\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(3\,e^4\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-\left(8\,\sqrt{-a}\,\sqrt{c}\,\left(4\,c\,d^2+a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(3\,e^4\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 494 leaves):

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

Problem 668: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 410 leaves, 7 steps):

$$-\frac{4 c \left(2 d \left(2 c d^2+a e^2\right)+e \left(5 c d^2+3 a e^2\right) x\right) \sqrt{a+c x^2}}{5 e^3 \left(c d^2+a e^2\right) (d+e x)^{3/2}}-\frac{2 \left(a+c x^2\right)^{3/2}}{5 e (d+e x)^{5/2}}-\left(8 \sqrt{-a}\, c^{3/2} \left(4 c d^2+3 a e^2\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\bigg/\left(5 e^4 \left(c d^2+a e^2\right) \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{a+c x^2}\right)+\left(32 \sqrt{-a}\, c^{3/2} d \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\bigg/\left(5 e^4 \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 602 leaves):

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

Problem 669: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+c\,x^2\right)^{3/2}}{\left(d+e\,x\right)^{9/2}}\,dx$$

Optimal (type 4, 491 leaves, 8 steps) :

$$\frac{32\,c^2\,d\,\left(c\,d^2+2\,a\,e^2\right)\,\sqrt{a+c\,x^2}}{35\,e^3\,\left(c\,d^2+a\,e^2\right)^2\,\sqrt{d+e\,x}}-\frac{4\,c\,\left(2\,d\,\left(2\,c\,d^2+a\,e^2\right)+e\,\left(7\,c\,d^2+5\,a\,e^2\right)\,x\right)\,\sqrt{a+c\,x^2}}{35\,e^3\,\left(c\,d^2+a\,e^2\right)\,\left(d+e\,x\right)^{5/2}}-\frac{2\,\left(a+c\,x^2\right)^{3/2}}{7\,e\,\left(d+e\,x\right)^{7/2}}+$$

$$\left(32\,\sqrt{-a}\,c^{5/2}\,d\,\left(c\,d^2+2\,a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(35\,e^4\,\left(c\,d^2+a\,e^2\right)^2\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-$$

$$\left(8\,\sqrt{-a}\,c^{3/2}\,\left(4\,c\,d^2+5\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(35\,e^4\,\left(c\,d^2+a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 659 leaves) :

$$\frac{1}{35\,e^5\,(c\,d^2+a\,e^2)^2\,(d+e\,x)^{7/2}\,\sqrt{a+c\,x^2}}$$

$$2\left(-e^2\,(a+c\,x^2)\,\left(5\,(c\,d^2+a\,e^2)^3-16\,c\,d\,(c\,d^2+a\,e^2)^2\,(d+e\,x)+\right.\right.$$

$$\left.c\,(c\,d^2+a\,e^2)\,(19\,c\,d^2+15\,a\,e^2)\,(d+e\,x)^2-16\,c^2\,d\,(c\,d^2+2\,a\,e^2)\,(d+e\,x)^3\right)-$$

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

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

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

$$\sqrt{a}\,e\,\left(4\,c^{3/2}\,d^3+i\sqrt{a}\,c\,d^2\,e+8\,a\,\sqrt{c}\,d\,e^2+5\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 670: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^{5/2}\,dx$$

Optimal (type 4, 566 leaves, 9 steps):

$$\frac{1}{9009 e^5}$$

$$8 \sqrt{d+e x} \left(d \left(32 c^2 d^4+113 a c d^2 e^2+177 a^2 e^4\right)-3 e \left(8 c^2 d^4+27 a c d^2 e^2-77 a^2 e^4\right) x\right) \sqrt{a+c x^2}+$$

$$\frac{20 \sqrt{d+e x} \left(4 d \left(2 c d^2+5 a e^2\right)-7 e \left(c d^2-11 a e^2\right) x\right) \left(a+c x^2\right)^{3/2}}{9009 e^3}-\frac{20 d \sqrt{d+e x} \left(a+c x^2\right)^{5/2}}{143 e}+$$

$$\frac{2 (d+e x)^{3/2} \left(a+c x^2\right)^{5/2}}{13 e}+\left(16 \sqrt{-a} \left(32 c^3 d^6+137 a c^2 d^4 e^2+258 a^2 c d^2 e^4-231 a^3 e^6\right)\right.$$

$$\left.\sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Big/$$

$$\left(9009 \sqrt{c} e^6 \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{a+c x^2}\right)-$$

$$\left(16 \sqrt{-a} d \left(c d^2+a e^2\right) \left(32 c^2 d^4+113 a c d^2 e^2+177 a^2 e^4\right) \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Big/\left(9009 \sqrt{c} e^6 \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 967 leaves):

$$\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\,\left(\frac{2\,d\,\left(128\,c^2\,d^4+532\,a\,c\,d^2\,e^2+971\,a^2\,e^4\right)}{9009\,e^5}+\frac{2\,\left(-96\,c^2\,d^4-394\,a\,c\,d^2\,e^2+2387\,a^2\,e^4\right)\,x}{9009\,e^4}+\frac{4\,c\,d\,\left(40\,c\,d^2+163\,a\,e^2\right)\,x^2}{9009\,e^3}+\frac{4\,c\,\left(-5\,c\,d^2+154\,a\,e^2\right)\,x^3}{1287\,e^2}+\frac{2\,c^2\,d\,x^4}{143\,e}+\frac{2\,c^2\,x^5}{13}\right)+$$

$$\frac{1}{9009\,c\,e^7\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,\sqrt{a+\frac{c\,(d+e\,x)^2\left(-1+\frac{d}{d+e\,x}\right)^2}{e^2}}}\,8\,(d+e\,x)^{3/2}\left(-2\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\right.$$

$$\left(-\frac{231\,a^4\,e^8}{(d+e\,x)^2}+a^2\,c^2\,d^2\,e^4\left(258+\frac{395\,d^2}{(d+e\,x)^2}-\frac{516\,d}{d+e\,x}\right)+a\,c^3\,d^4\,e^2\left(137+\frac{169\,d^2}{(d+e\,x)^2}-\frac{274\,d}{d+e\,x}\right)+\right.$$

$$\left.32\,c^4\,d^6\left(-1+\frac{d}{d+e\,x}\right)^2+3\,a^3\,c\,e^6\left(-77+\frac{9\,d^2}{(d+e\,x)^2}+\frac{154\,d}{d+e\,x}\right)\right)+\frac{1}{\sqrt{d+e\,x}}$$

$$2\sqrt{c}\,\left(32\,i\,c^{7/2}\,d^7-32\sqrt{a}\,c^3\,d^6\,e+137\,i\,a\,c^{5/2}\,d^5\,e^2-137\,a^{3/2}\,c^2\,d^4\,e^3+258\,i\,a^2\,c^{3/2}\,d^3\,e^4-\right.$$

$$\left.258\,a^{5/2}\,c\,d^2\,e^5-231\,i\,a^3\sqrt{c}\,d\,e^6+231\,a^{7/2}\,e^7\right)\sqrt{1-\frac{d}{d+e\,x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e\,x)}}$$

$$\sqrt{1-\frac{d}{d+e\,x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e\,x)}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+$$

$$\frac{1}{\sqrt{d+e\,x}}2\sqrt{a}\,\sqrt{c}\,e\,\left(32\,c^3\,d^6+8\,i\sqrt{a}\,c^{5/2}\,d^5\,e+137\,a\,c^2\,d^4\,e^2+32\,i\,a^{3/2}\,c^{3/2}\,d^3\,e^3+\right.$$

$$\left.258\,a^2\,c\,d^2\,e^4+408\,i\,a^{5/2}\sqrt{c}\,d\,e^5-231\,a^3\,e^6\right)\sqrt{1-\frac{d}{d+e\,x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e\,x)}}$$

$$\left.\sqrt{1-\frac{d}{d+e\,x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e\,x)}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)$$

Problem 671: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+c\,x^2\right)^{5/2}}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 494 leaves, 8 steps):

$$\frac{1}{693\, e^5} 8 \sqrt{d+e\,x}\, \left(32\, c^2\, d^4 + 69\, a\, c\, d^2\, e^2 + 45\, a^2\, e^4 - 24\, c\, d\, e\, \left(c\, d^2 + 2\, a\, e^2\right)\, x\right) \sqrt{a+c\,x^2} + \frac{20 \sqrt{d+e\,x}\, \left(8\, c\, d^2 + 9\, a\, e^2 - 7\, c\, d\, e\, x\right) \left(a+c\,x^2\right)^{3/2}}{693\, e^3} + \frac{2 \sqrt{d+e\,x}\, \left(a+c\,x^2\right)^{5/2}}{11\, e} +$$

$$\left(16 \sqrt{-a}\, \sqrt{c}\, d\, \left(32\, c^2\, d^4 + 93\, a\, c\, d^2\, e^2 + 93\, a^2\, e^4\right) \sqrt{d+e\,x}\, \sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\, -\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d - a\,e}\right]\right) \Bigg/ \left(693\, e^6 \sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\, \sqrt{a+c\,x^2}\right) -$$

$$\left(16 \sqrt{-a}\, \left(c\, d^2 + a\, e^2\right) \left(32\, c^2\, d^4 + 69\, a\, c\, d^2\, e^2 + 45\, a^2\, e^4\right) \sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\, \sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\, -\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d - a\,e}\right]\right) \Bigg/ \left(693 \sqrt{c}\, e^6 \sqrt{d+e\,x}\, \sqrt{a+c\,x^2}\right)$$

Result (type 4, 634 leaves) :

$$\frac{1}{693\, e^7 \sqrt{a+c\,x^2}}$$

$$2\sqrt{d+e\,x}\left(-\frac{8\,d\,e^2\left(32\,c^2\,d^4+93\,a\,c\,d^2\,e^2+93\,a^2\,e^4\right)\left(a+c\,x^2\right)}{d+e\,x}+e^2\left(a+c\,x^2\right)\left(333\,a^2\,e^4+2\,a\,c\,e^2\right.\right.$$

$$\left.\left(178\,d^2-131\,d\,e\,x+108\,e^2\,x^2\right)+c^2\left(128\,d^4-96\,d^3\,e\,x+80\,d^2\,e^2\,x^2-70\,d\,e^3\,x^3+63\,e^4\,x^4\right)\right)-$$

$$8\,i\,c\,d\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(32\,c^2\,d^4+93\,a\,c\,d^2\,e^2+93\,a^2\,e^4\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}$$

$$\sqrt{d+e\,x}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+\frac{1}{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}$$

$$8\sqrt{a}\,e\left(32\,c^{5/2}\,d^5+8\,i\sqrt{a}\,c^2\,d^4\,e+93\,a\,c^{3/2}\,d^3\,e^2+21\,i\,a^{3/2}\,c\,d^2\,e^3+93\,a^2\sqrt{c}\,d\,e^4+45\,i\,a^{5/2}\,e^5\right)$$

$$\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\sqrt{d+e\,x}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)$$

Problem 672: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 457 leaves, 8 steps):

$$-\frac{8\,c\,\sqrt{d+e\,x}\,\left(d\,\left(32\,c\,d^2+33\,a\,e^2\right)-3\,e\,\left(8\,c\,d^2+7\,a\,e^2\right)\,x\right)\,\sqrt{a+c\,x^2}}{63\,e^5}-$$

$$\frac{20\,c\,\left(8\,d-7\,e\,x\right)\,\sqrt{d+e\,x}\,\left(a+c\,x^2\right)^{3/2}}{63\,e^3}-\frac{2\,\left(a+c\,x^2\right)^{5/2}}{e\,\sqrt{d+e\,x}}-$$

$$\left(16\,\sqrt{-a}\,\sqrt{c}\,\left(32\,c^2\,d^4+57\,a\,c\,d^2\,e^2+21\,a^2\,e^4\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\,-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(63\,e^6\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)+$$

$$\left(16\,\sqrt{-a}\,\sqrt{c}\,d\,\left(c\,d^2+a\,e^2\right)\,\left(32\,c\,d^2+33\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\,-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(63\,e^6\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 684 leaves) :

$$\frac{1}{63\sqrt{a+c x^2}}\sqrt{d+e x}\left(-\frac{1}{e^5 (d+e x)}2 (a+c x^2) (63 a^2 e^4+2 a c e^2 (106 d^2+29 d e x-14 e^2 x^2)+c^2 (128 d^4+32 d^3 e x-16 d^2 e^2 x^2+10 d e^3 x^3-7 e^4 x^4))+\frac{1}{e^7\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}(d+e x)}16\left(e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}(32 c^2 d^4+57 a c d^2 e^2+21 a^2 e^4)(a+c x^2)+\sqrt{c}\,(-32 i c^{5/2} d^5+32\sqrt{a}\,c^2 d^4 e-57 i a c^{3/2} d^3 e^2+57 a^{3/2} c d^2 e^3-21 i a^2\sqrt{c}\,d e^4+21 a^{5/2} e^5)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e x}{d+e x}}(d+e x)^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]-\sqrt{a}\sqrt{c}\,e\,(32 c^2 d^4+8 i\sqrt{a}\,c^{3/2} d^3 e+57 a c d^2 e^2+12 i a^{3/2}\sqrt{c}\,d e^3+21 a^2 e^4)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e x}{d+e x}}(d+e x)^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)$$

Problem 673: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 430 leaves, 8 steps):

$$\frac{8\,c\,\sqrt{d+e\,x}\,\left(32\,c\,d^2+5\,a\,e^2-24\,c\,d\,e\,x\right)\,\sqrt{a+c\,x^2}}{21\,e^5}+\frac{20\,c\,\left(8\,d+e\,x\right)\,\left(a+c\,x^2\right)^{3/2}}{21\,e^3\,\sqrt{d+e\,x}}-$$

$$\frac{2\,\left(a+c\,x^2\right)^{5/2}}{3\,e\,\left(d+e\,x\right)^{3/2}}+\left(16\,\sqrt{-a}\,c^{3/2}\,d\,\left(32\,c\,d^2+29\,a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\bigg/\left(21\,e^6\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)-$$

$$\left(16\,\sqrt{-a}\,\sqrt{c}\,\left(c\,d^2+a\,e^2\right)\,\left(32\,c\,d^2+5\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\bigg/\left(21\,e^6\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 637 leaves) :

$$\frac{1}{21\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{1}{e^5\,(d+e\,x)^2}2\,\left(a+c\,x^2\right)\,\left(-7\,a^2\,e^4+2\,a\,c\,e^2\,\left(50\,d^2+65\,d\,e\,x+8\,e^2\,x^2\right)+c^2\,\left(128\,d^4+160\,d^3\,e\,x+16\,d^2\,e^2\,x^2-6\,d\,e^3\,x^3+3\,e^4\,x^4\right)\right)-\frac{1}{e^7\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(d+e\,x)}16\,c\left(d\,e^2\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,\left(29\,a^2\,e^2+32\,c^2\,d^2\,x^2+a\,c\,\left(32\,d^2+29\,e^2\,x^2\right)\right)+\sqrt{c}\,d\,\left(-32\,i\,c^{3/2}\,d^3+32\,\sqrt{a}\,c\,d^2\,e-29\,i\,a\,\sqrt{c}\,d\,e^2+29\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,(d+e\,x)^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]-\sqrt{a}\,e\,\left(32\,c^{3/2}\,d^3+8\,i\,\sqrt{a}\,c\,d^2\,e+29\,a\,\sqrt{c}\,d\,e^2+5\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,(d+e\,x)^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)$$

Problem 674: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+c\,x^2\right)^{5/2}}{(d+e\,x)^{7/2}}\,dx$$

Optimal (type 4, 420 leaves, 8 steps):

$$-\frac{8\,c\,\left(32\,c\,d^2+9\,a\,e^2+8\,c\,d\,e\,x\right)\,\sqrt{a+c\,x^2}}{15\,e^5\,\sqrt{d+e\,x}}+\frac{4\,c\,\left(8\,d+3\,e\,x\right)\,\left(a+c\,x^2\right)^{3/2}}{15\,e^3\,\left(d+e\,x\right)^{3/2}}-$$

$$\frac{2\,\left(a+c\,x^2\right)^{5/2}}{5\,e\,\left(d+e\,x\right)^{5/2}}-\left(16\,\sqrt{-a}\,\,c^{3/2}\,\left(32\,c\,d^2+9\,a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\,-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(15\,e^6\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)+$$

$$\left(16\,\sqrt{-a}\,\,c^{3/2}\,d\,\left(32\,c\,d^2+17\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\,-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/\left(15\,e^6\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 613 leaves) :

$$\frac{1}{15\,e^7\,(d+e\,x)^{5/2}\,\sqrt{a+c\,x^2}}\,2\left(-e^2\,(a+c\,x^2)\,\left(3\,a^2\,e^4+2\,a\,c\,e^2\,(10\,d^2+25\,d\,e\,x+18\,e^2\,x^2)+c^2\,(128\,d^4+288\,d^3\,e\,x+176\,d^2\,e^2\,x^2+10\,d\,e^3\,x^3-3\,e^4\,x^4)\right)+\frac{1}{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}\,8\,c\,(d+e\,x)^2\left(e^2\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(9\,a^2\,e^2+32\,c^2\,d^2\,x^2+a\,c\,(32\,d^2+9\,e^2\,x^2))+\sqrt{c}\,\left(-32\,i\,c^{3/2}\,d^3+32\,\sqrt{a}\,c\,d^2\,e-9\,i\,a\,\sqrt{c}\,d\,e^2+9\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,(d+e\,x)^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-i\,\sqrt{a}\,e}{\sqrt{c}\,d+i\,\sqrt{a}\,e}\right]-\sqrt{a}\,\sqrt{c}\,e\,\left(32\,c\,d^2+8\,i\,\sqrt{a}\,\sqrt{c}\,d\,e+9\,a\,e^2\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,(d+e\,x)^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-i\,\sqrt{a}\,e}{\sqrt{c}\,d+i\,\sqrt{a}\,e}\right]\right)\right)$$

Problem 675: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+c\,x^2)^{5/2}}{(d+e\,x)^{9/2}}\,dx$$

Optimal (type 4, 498 leaves, 8 steps):

$$\frac{8 c^2 \left(d \left(32 c d^2+29 a e^2\right)+e \left(8 c d^2+5 a e^2\right) x\right) \sqrt{a+c x^2}}{21 e^5 \left(c d^2+a e^2\right) \sqrt{d+e x}}-\frac{4 c \left(2 d \left(4 c d^2+a e^2\right)+e \left(11 c d^2+5 a e^2\right) x\right) \left(a+c x^2\right)^{3/2}}{21 e^3 \left(c d^2+a e^2\right) \left(d+e x\right)^{5/2}}-$$

$$\frac{2 \left(a+c x^2\right)^{5/2}}{7 e \left(d+e x\right)^{7/2}}+\left(16 \sqrt{-a}\, c^{5/2} d \left(32 c d^2+29 a e^2\right) \sqrt{d+e x}\right.$$

$$\left.\sqrt{1+\frac{c x^2}{a}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a}\sqrt{c}\, d-a e}\right]\right)\Big/$$

$$\left(21 e^6 \left(c d^2+a e^2\right) \sqrt{\frac{\sqrt{c}\left(d+e x\right)}{\sqrt{c}\, d+\sqrt{-a}\, e}}\ \sqrt{a+c x^2}\right)-$$

$$\left(16 \sqrt{-a}\, c^{3/2} \left(32 c d^2+5 a e^2\right) \sqrt{\frac{\sqrt{c}\left(d+e x\right)}{\sqrt{c}\, d+\sqrt{-a}\, e}}\ \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a}\sqrt{c}\, d-a e}\right]\right)\Big/\left(21 e^6 \sqrt{d+e x}\ \sqrt{a+c x^2}\right)$$

Result (type 4, 677 leaves):

$$\frac{1}{21\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{1}{e^5}2\left(a+c\,x^2\right)\left(7\,c^2-\frac{3\left(c\,d^2+a\,e^2\right)^2}{\left(d+e\,x\right)^4}+\frac{18\,c\,d\left(c\,d^2+a\,e^2\right)}{\left(d+e\,x\right)^3}-\frac{4\,c\left(13\,c\,d^2+4\,a\,e^2\right)}{\left(d+e\,x\right)^2}+\right.\right.$$

$$\left.\frac{2\,c^2\,d\left(79\,c\,d^2+67\,a\,e^2\right)}{\left(c\,d^2+a\,e^2\right)\left(d+e\,x\right)}\right)-\frac{1}{e^7\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(c\,d^2+a\,e^2\right)\left(d+e\,x\right)}$$

$$16\,c^2\left(d\,e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(29\,a^2\,e^2+32\,c^2\,d^2\,x^2+a\,c\left(32\,d^2+29\,e^2\,x^2\right)\right)+\right.$$

$$\sqrt{c}\,d\left(-32\,i\,c^{3/2}\,d^3+32\sqrt{a}\,c\,d^2\,e-29\,i\,a\sqrt{c}\,d\,e^2+29\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

$$\sqrt{a}\,e\left(32\,c^{3/2}\,d^3+8\,i\sqrt{a}\,c\,d^2\,e+29\,a\sqrt{c}\,d\,e^2+5\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 676: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+c\,x^2\right)^{5/2}}{\left(d+e\,x\right)^{11/2}}\,dx$$

Optimal (type 4, 553 leaves, 8 steps):

$$-\left(\left(8 c^2 \left(d \left(32 c^2 d^4+49 a c d^2 e^2+9 a^2 e^4\right)+e \left(40 c^2 d^4+69 a c d^2 e^2+21 a^2 e^4\right) x\right) \sqrt{a+c x^2}\right)\Big/\left(63 e^5 \left(c d^2+a e^2\right)^2 (d+e x)^{3/2}\right)\right)-\frac{4 c \left(2 d \left(4 c d^2+a e^2\right)+e \left(13 c d^2+7 a e^2\right) x\right) \left(a+c x^2\right)^{3/2}}{63 e^3 \left(c d^2+a e^2\right) (d+e x)^{7/2}}-\frac{2 \left(a+c x^2\right)^{5/2}}{9 e (d+e x)^{9/2}}-$$

$$\left(16 \sqrt{-a}\, c^{5/2} \left(32 c^2 d^4+57 a c d^2 e^2+21 a^2 e^4\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/$$

$$\left(63 e^6 \left(c d^2+a e^2\right)^2 \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{a+c x^2}\right)+$$

$$\left(16 \sqrt{-a}\, c^{5/2} d \left(32 c d^2+33 a e^2\right) \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/\left(63 e^6 \left(c d^2+a e^2\right) \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 913 leaves):

$$\sqrt{d+e x}\,\sqrt{a+c x^2}\,\left(-\frac{2\,(c d^2+a e^2)^2}{9 e^5\,(d+e x)^5}+\frac{76 c d\,(c d^2+a e^2)}{63 e^5\,(d+e x)^4}-\frac{8 c\,(22 c d^2+7 a e^2)}{63 e^5\,(d+e x)^3}+\frac{4 c^2 d\,(61 c d^2+57 a e^2)}{63 e^5\,(c d^2+a e^2)\,(d+e x)^2}-\frac{2 c^2\,(193 c^2 d^4+330 a c d^2 e^2+105 a^2 e^4)}{63 e^5\,(c d^2+a e^2)^2\,(d+e x)}\right)+$$

$$\frac{1}{63 e^7\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(c d^2+a e^2)^2\,\sqrt{a+\frac{c\,(d+e x)^2\,\left(-1+\frac{d}{d+e x}\right)^2}{e^2}}}$$

$$16 c^2\,(d+e x)^{3/2}\left(\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,\left(\frac{21 a^3 e^6}{(d+e x)^2}+a c^2 d^2 e^2\left(57+\frac{89 d^2}{(d+e x)^2}-\frac{114 d}{d+e x}\right)+3 a^2 c e^4\left(7+\frac{26 d^2}{(d+e x)^2}-\frac{14 d}{d+e x}\right)+32 c^3 d^4\left(-1+\frac{d}{d+e x}\right)^2\right)+\frac{1}{\sqrt{d+e x}}\right.$$

$$\sqrt{c}\,\left(-32 i c^{5/2} d^5+32\sqrt{a}\,c^2 d^4 e-57 i a c^{3/2} d^3 e^2+57 a^{3/2} c d^2 e^3-21 i a^2\sqrt{c}\,d e^4+21 a^{5/2} e^5\right)\sqrt{1-\frac{d}{d+e x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}\,\sqrt{1-\frac{d}{d+e x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]-\frac{1}{\sqrt{d+e x}}$$

$$\sqrt{a}\,\sqrt{c}\,e\,\left(32 c^2 d^4+8 i\sqrt{a}\,c^{3/2} d^3 e+57 a c d^2 e^2+12 i a^{3/2}\sqrt{c}\,d e^3+21 a^2 e^4\right)\sqrt{1-\frac{d}{d+e x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}\,\sqrt{1-\frac{d}{d+e x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)$$

Problem 677: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 413 leaves, 8 steps):

$$\frac{2 e \left(71 c d^2-25 a e^2\right) \sqrt{d+e x} \sqrt{a+c x^2}}{105 c^2}+\frac{24 d e (d+e x)^{3/2} \sqrt{a+c x^2}}{35 c}+$$

$$\frac{2 e (d+e x)^{5/2} \sqrt{a+c x^2}}{7 c}-\left(32 \sqrt{-a}\, d \left(11 c d^2-13 a e^2\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\right.\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right) \Bigg/ \left(105 c^{3/2} \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{a+c x^2}\right)+$$

$$\left(2 \sqrt{-a} \left(71 c d^2-25 a e^2\right) \left(c d^2+a e^2\right) \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right) \Bigg/ \left(105 c^{5/2} \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 548 leaves) :

$$\frac{1}{105\,c^2\sqrt{a+c\,x^2}}\,2\sqrt{d+e\,x}\left(\frac{16\,d\,e\left(-13\,a^2\,e^2+11\,c^2\,d^2\,x^2+a\,c\left(11\,d^2-13\,e^2\,x^2\right)\right)}{d+e\,x}+\right.$$
$$\left(a+c\,x^2\right)\left(-25\,a\,e^3+c\,e\left(122\,d^2+66\,d\,e\,x+15\,e^2\,x^2\right)\right)+\frac{1}{e}$$
$$16\,i\,c\,d\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(11\,c\,d^2-13\,a\,e^2\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\sqrt{d+e\,x}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+\frac{1}{e\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}$$
$$\left(105\,i\,c^2\,d^4-176\sqrt{a}\,c^{3/2}\,d^3\,e-254\,i\,a\,c\,d^2\,e^2+208\,a^{3/2}\sqrt{c}\,d\,e^3+25\,i\,a^2\,e^4\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$
$$\left.\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\sqrt{d+e\,x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)$$

Problem 678: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^{5/2}}{\sqrt{a+c\,x^2}}\,dx$$

Optimal (type 4, 359 leaves, 7 steps):

$$\frac{16\,d\,e\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}}{15\,c}+\frac{2\,e\,\left(d+e\,x\right)^{3/2}\,\sqrt{a+c\,x^2}}{5\,c}-\left(2\,\sqrt{-a}\,\left(23\,c\,d^2-9\,a\,e^2\right)\right.$$

$$\left.\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/$$

$$\left(15\,c^{3/2}\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)+\left(16\,\sqrt{-a}\,d\,\left(c\,d^2+a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/\left(15\,c^{3/2}\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 557 leaves) :

$$\frac{1}{15\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{2\,e\,(11\,d+3\,e\,x)\,\left(a+c\,x^2\right)}{c}+\right.$$

$$\frac{1}{c^2\,e\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,(d+e\,x)}\,2\left(e^2\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(-9\,a^2\,e^2+23\,c^2\,d^2\,x^2+a\,c\,\left(23\,d^2-9\,e^2\,x^2\right)\right)+\right.$$

$$\sqrt{c}\,\left(-23\,i\,c^{3/2}\,d^3+23\,\sqrt{a}\,c\,d^2\,e+9\,i\,a\,\sqrt{c}\,d\,e^2-9\,a^{3/2}\,e^3\right)\,\sqrt{\frac{e\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

$$\sqrt{c}\,\left(15\,i\,c^{3/2}\,d^3-23\,\sqrt{a}\,c\,d^2\,e-17\,i\,a\,\sqrt{c}\,d\,e^2+9\,a^{3/2}\,e^3\right)\,\sqrt{\frac{e\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 679: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 317 leaves, 6 steps):

$$\frac{2 e \sqrt{d+e x} \sqrt{a+c x^2}}{3 c} - \left(8 \sqrt{-a}\, d \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right], -\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right) \Big/$$

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

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

Result (type 4, 445 leaves):

$$\frac{1}{3 c e \sqrt{a+c x^2}}$$

$$2 \sqrt{d+e x} \left(e^2 \left(a+c x^2\right)+\frac{4 d e^2 \left(a+c x^2\right)}{d+e x}+4 i c d \sqrt{-d-\frac{i \sqrt{a}\, e}{\sqrt{c}}} \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}} \sqrt{-\frac{\frac{i \sqrt{a}\, e}{\sqrt{c}}-e x}{d+e x}}\right.$$

$$\sqrt{d+e x}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i \sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d+e x}}\right], \frac{\sqrt{c}\, d-i \sqrt{a}\, e}{\sqrt{c}\, d+i \sqrt{a}\, e}\right] +$$

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

$$\left.\sqrt{d+e x}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i \sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d+e x}}\right], \frac{\sqrt{c}\, d-i \sqrt{a}\, e}{\sqrt{c}\, d+i \sqrt{a}\, e}\right]\right)$$

Problem 680: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{d+e\,x}}{\sqrt{a+c\,x^2}}\,dx$$

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

$$-\left(\left(2\sqrt{-a}\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/\left(\sqrt{c}\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}\right)\right)$$

Result (type 4, 294 leaves):

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

Problem 681: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}}\,dx$$

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

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

Result (type 4, 186 leaves):

$$\left(2\,\mathrm{i}\sqrt{\frac{e\left(\frac{\mathrm{i}\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,(d+e\,x)\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-\mathrm{i}\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\sqrt{a}\,e}\right]\right)\Big/\left(e\sqrt{-d-\frac{\mathrm{i}\sqrt{a}\,e}{\sqrt{c}}}\sqrt{a+c\,x^2}\right)$$

Problem 682: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 186 leaves, 4 steps):

$$-\frac{2\,e\sqrt{a+c\,x^2}}{\left(c\,d^2+a\,e^2\right)\sqrt{d+e\,x}}-\left(2\sqrt{-a}\,\sqrt{c}\,\sqrt{d+e\,x}\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Big/\left(\left(c\,d^2+a\,e^2\right)\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\sqrt{a+c\,x^2}\right)$$

Result (type 4, 331 leaves):

$$-\frac{2 e \sqrt{a+c x^2}}{\left(c d^2+a e^2\right) \sqrt{d+e x}}-\left(2 \sqrt{c} \sqrt{\frac{e \left(\sqrt{a}+\mathrm{i} \sqrt{c} x\right)}{-\mathrm{i} \sqrt{c} d+\sqrt{a} e}} \sqrt{d+e x} \left(\text{EllipticE}\left[\mathrm{i} \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{c} (d+e x)}{\sqrt{c} d-\mathrm{i} \sqrt{a} e}}\right],\frac{\sqrt{c} d-\mathrm{i} \sqrt{a} e}{\sqrt{c} d+\mathrm{i} \sqrt{a} e}\right]-\text{EllipticF}\left[\mathrm{i} \text{ArcSinh}\left[\sqrt{-\frac{\sqrt{c} (d+e x)}{\sqrt{c} d-\mathrm{i} \sqrt{a} e}}\right],\frac{\sqrt{c} d-\mathrm{i} \sqrt{a} e}{\sqrt{c} d+\mathrm{i} \sqrt{a} e}\right]\right)\right)\Bigg/\left(e \left(\mathrm{i} \sqrt{c} d+\sqrt{a} e\right) \sqrt{\frac{\sqrt{c} (d+e x)}{e \left(\mathrm{i} \sqrt{a}+\sqrt{c} x\right)}} \sqrt{a+c x^2}\right)$$

Problem 683: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 382 leaves, 7 steps):

$$-\frac{2 e \sqrt{a+c x^2}}{3 \left(c d^2+a e^2\right) (d+e x)^{3/2}}-\frac{8 c d e \sqrt{a+c x^2}}{3 \left(c d^2+a e^2\right)^2 \sqrt{d+e x}}-\left(8 \sqrt{-a}\, c^{3/2} d \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Bigg/\left(3 \left(c d^2+a e^2\right)^2 \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{a+c x^2}\right)+\left(2 \sqrt{-a} \sqrt{c} \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{1+\frac{c x^2}{a}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right)\Bigg/\left(3 \left(c d^2+a e^2\right) \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 494 leaves):

$$\left(2\left(-e^2\left(a+c\,x^2\right)\left(a\,e^2+c\,d\left(5\,d+4\,e\,x\right)\right)+\frac{1}{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}\right.\right.$$

$$c\left(d+e\,x\right)\left(4\,d\,e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(a+c\,x^2\right)+4\sqrt{c}\,d\left(-i\sqrt{c}\,d+\sqrt{a}\,e\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\right.$$

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

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

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\right)\Bigg/$$

$$\left(3\,e\left(c\,d^2+a\,e^2\right)^2\left(d+e\,x\right)^{3/2}\sqrt{a+c\,x^2}\right)$$

Problem 684: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\left(d+e\,x\right)^{7/2}\sqrt{a+c\,x^2}}\,dx$$

Optimal (type 4, 447 leaves, 8 steps):

$$-\frac{2 e \sqrt{a+c x^2}}{5 \left(c d^2+a e^2\right) (d+e x)^{5/2}}-\frac{16 c d e \sqrt{a+c x^2}}{15 \left(c d^2+a e^2\right)^2 (d+e x)^{3/2}}-$$

$$\frac{2 c e \left(23 c d^2-9 a e^2\right) \sqrt{a+c x^2}}{15 \left(c d^2+a e^2\right)^3 \sqrt{d+e x}}-\left(2 \sqrt{-a}\, c^{3/2} \left(23 c d^2-9 a e^2\right)\right.$$

$$\left.\sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/$$

$$\left(15 \left(c d^2+a e^2\right)^3 \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{a+c x^2}\right)+\left(16 \sqrt{-a}\, c^{3/2} d \sqrt{\frac{\sqrt{c}\, (d+e x)}{\sqrt{c}\, d+\sqrt{-a}\, e}} \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/\left(15 \left(c d^2+a e^2\right)^2 \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 618 leaves) :

$$\frac{1}{15\, e\, \left(c\, d^2+a\, e^2\right)^3\, (d+e\, x)^{5/2}\, \sqrt{a+c\, x^2}}$$
$$2\left(-e^2\left(a+c\, x^2\right)\left(3\left(c\, d^2+a\, e^2\right)^2+8\, c\, d\left(c\, d^2+a\, e^2\right)(d+e\, x)+c\left(23\, c\, d^2-9\, a\, e^2\right)(d+e\, x)^2\right)-\right.$$
$$\frac{1}{\sqrt{-d-\frac{i\sqrt{a}\, e}{\sqrt{c}}}}\, c\, (d+e\, x)^2\left(-e^2\sqrt{-d-\frac{i\sqrt{a}\, e}{\sqrt{c}}}\left(-9\, a^2\, e^2+23\, c^2\, d^2\, x^2+a\, c\left(23\, d^2-9\, e^2\, x^2\right)\right)+\right.$$
$$\sqrt{c}\left(23\, i\, c^{3/2}\, d^3-23\sqrt{a}\, c\, d^2\, e-9\, i\, a\sqrt{c}\, d\, e^2+9\, a^{3/2}\, e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\, x}}$$
$$\sqrt{-\frac{\frac{i\sqrt{a}\, e}{\sqrt{c}}-e\, x}{d+e\, x}}\, (d+e\, x)^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d+e\, x}}\right],\, \frac{\sqrt{c}\, d-i\sqrt{a}\, e}{\sqrt{c}\, d+i\sqrt{a}\, e}\right]+$$
$$\sqrt{c}\left(-15\, i\, c^{3/2}\, d^3+23\sqrt{a}\, c\, d^2\, e+17\, i\, a\sqrt{c}\, d\, e^2-9\, a^{3/2}\, e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\, x}}$$
$$\left.\left.\sqrt{-\frac{\frac{i\sqrt{a}\, e}{\sqrt{c}}-e\, x}{d+e\, x}}\, (d+e\, x)^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\, e}{\sqrt{c}}}}{\sqrt{d+e\, x}}\right],\, \frac{\sqrt{c}\, d-i\sqrt{a}\, e}{\sqrt{c}\, d+i\sqrt{a}\, e}\right]\right)\right)$$

Problem 685: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 426 leaves, 8 steps):

$$-\frac{(a e - c d x)\,(d + e x)^{5/2}}{a c \sqrt{a + c x^2}} - \frac{e\,(3 c d^2 - 5 a e^2)\,\sqrt{d + e x}\,\sqrt{a + c x^2}}{3 a c^2} - \frac{d e\,(d + e x)^{3/2}\,\sqrt{a + c x^2}}{a c} -$$

$$\left(d\,(3 c d^2 - 29 a e^2)\,\sqrt{d + e x}\,\sqrt{1 + \frac{c x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1 - \frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right], -\frac{2 a e}{\sqrt{-a}\,\sqrt{c}\,d - a e}\right]\right) \Bigg/$$

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

$$\left((3 c d^2 - 5 a e^2)\,(c d^2 + a e^2)\,\sqrt{\frac{\sqrt{c}\,(d + e x)}{\sqrt{c}\,d + \sqrt{-a}\,e}}\,\sqrt{1 + \frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1 - \frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right], -\frac{2 a e}{\sqrt{-a}\,\sqrt{c}\,d - a e}\right]\right) \Bigg/ \left(3\,\sqrt{-a}\,c^{5/2}\,\sqrt{d + e x}\,\sqrt{a + c x^2}\right)$$

Result (type 4, 586 leaves) :

$$\frac{1}{6\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{10\,a\,e^3}{c^2}+\frac{6\,d^3\,x}{a}+\frac{2\,e\left(-9\,d^2-9\,d\,e\,x+2\,e^2\,x^2\right)}{c}+\frac{1}{a\,c^2\,e\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,(d+e\,x)}\right.$$

$$2\left(-d\,e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(-29\,a^2\,e^2+3\,c^2\,d^2\,x^2+a\,c\left(3\,d^2-29\,e^2\,x^2\right)\right)+\right.$$

$$\sqrt{c}\,d\left(3\,i\,c^{3/2}\,d^3-3\sqrt{a}\,c\,d^2\,e-29\,i\,a\sqrt{c}\,d\,e^2+29\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

$$\sqrt{a}\,e\left(3\,c^{3/2}\,d^3+27\,i\sqrt{a}\,c\,d^2\,e-29\,a\sqrt{c}\,d\,e^2-5\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 686: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 363 leaves, 7 steps):

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

Result (type 4, 495 leaves):

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

Problem 687: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 321 leaves, 6 steps):

$$-\frac{(a\,e-c\,d\,x)\,\sqrt{d+e\,x}}{a\,c\,\sqrt{a+c\,x^2}}-\frac{d\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]}{\sqrt{-a}\,\sqrt{c}\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}}+$$

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

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

Result (type 4, 542 leaves):

$$\frac{(-a e+c d x)\sqrt{d+e x}}{a c\sqrt{a+c x^2}}-$$

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

$$\left(-i\sqrt{c}\,d+\sqrt{a}\,e\right)\sqrt{1-\frac{d}{d+e x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}\sqrt{1-\frac{d}{d+e x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]-\frac{1}{\sqrt{d+e x}}$$

$$\sqrt{a}\,e\left(\sqrt{c}\,d+i\sqrt{a}\,e\right)\sqrt{1-\frac{d}{d+e x}-\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}\sqrt{1-\frac{d}{d+e x}+\frac{i\sqrt{a}\,e}{\sqrt{c}\,(d+e x)}}$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\Bigg/$$

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

Problem 688: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 298 leaves, 7 steps):

$$\frac{x\sqrt{d+e\,x}}{a\sqrt{a+c\,x^2}}-\frac{\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]}{\sqrt{-a}\,\sqrt{c}\,\sqrt{\frac{\sqrt{c}\,(d+e\,x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{a+c\,x^2}}+$$

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

$$\left(\sqrt{-a}\,\sqrt{c}\,\sqrt{d+e\,x}\,\sqrt{a+c\,x^2}\right)$$

Result (type 4, 408 leaves):

$$\frac{1}{a\sqrt{a+c\,x^2}}$$

$$\sqrt{d+e\,x}\left(x-\frac{e\,(a+c\,x^2)}{c\,(d+e\,x)}-\frac{1}{e}\,\mathrm{i}\,\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}\,\sqrt{\frac{e\left(\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,\sqrt{d+e\,x}\;\text{EllipticE}\left[\right.\right.$$

$$\left.\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e}\right]+\left(\sqrt{a}\,\sqrt{\frac{e\left(\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,\sqrt{d+e\,x}\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e}\right]\right)\Big/\left(\sqrt{c}\,\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}\right)\right)$$

Problem 689: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 6 steps):

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

Result (type 4, 430 leaves):

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

Problem 690: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 406 leaves, 7 steps):

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

$$\left(\sqrt{c} \left(c d^2 - 3 a e^2\right) \sqrt{d + e x} \sqrt{1 + \frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1 - \frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right], -\frac{2 a e}{\sqrt{-a} \sqrt{c} d - a e}\right]\right) \Big/$$

$$\left(\sqrt{-a} \left(c d^2 + a e^2\right)^2 \sqrt{\frac{\sqrt{c} (d + e x)}{\sqrt{c} d + \sqrt{-a} e}} \sqrt{a + c x^2}\right) +$$

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

$$\left(\sqrt{-a} \left(c d^2 + a e^2\right) \sqrt{d + e x} \sqrt{a + c x^2}\right)$$

Result (type 4, 583 leaves) :

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

$$\left(-e^2\,\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\,\left(-3\,a^2\,e^2+c^2\,d^2\,x^2+a\,c\,\left(d^2-3\,e^2\,x^2\right)\right)+\right.$$

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

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

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

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

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

Problem 691: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 485 leaves, 8 steps):

$$\frac{a e + c d x}{a \left(c d^2 + a e^2\right) (d + e x)^{3/2} \sqrt{a + c x^2}} + \frac{e \left(3 c d^2 - 5 a e^2\right) \sqrt{a + c x^2}}{3 a \left(c d^2 + a e^2\right)^2 (d + e x)^{3/2}} + \frac{c d e \left(3 c d^2 - 29 a e^2\right) \sqrt{a + c x^2}}{3 a \left(c d^2 + a e^2\right)^3 \sqrt{d + e x}} -$$

$$\left(c^{3/2} d \left(3 c d^2 - 29 a e^2\right) \sqrt{d + e x} \sqrt{1 + \frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1 - \frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right], -\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d - a e}\right]\right) \Bigg/ \left(3 \sqrt{-a} \left(c d^2 + a e^2\right)^3 \sqrt{\frac{\sqrt{c}\, (d + e x)}{\sqrt{c}\, d + \sqrt{-a}\, e}} \sqrt{a + c x^2}\right) +$$

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

Result (type 4, 634 leaves) :

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

$$20\,a\,c\,d\,e^3\,\left(d+e\,x\right)\,\left(a+c\,x^2\right)+3\,c\,\left(d+e\,x\right)^2\,\left(-a^2\,e^3+c^2\,d^3\,x+3\,a\,c\,d\,e\,\left(d-e\,x\right)\right)+$$

$$\frac{1}{e\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}}c\,\left(d+e\,x\right)\left(-d\,e^2\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(-29\,a^2\,e^2+3\,c^2\,d^2\,x^2+a\,c\,\left(3\,d^2-29\,e^2\,x^2\right)\right)+\right.$$

$$\sqrt{c}\,d\,\left(3\,i\,c^{3/2}\,d^3-3\,\sqrt{a}\,c\,d^2\,e-29\,i\,a\,\sqrt{c}\,d\,e^2+29\,a^{3/2}\,e^3\right)\,\sqrt{\frac{e\,\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

$$\sqrt{a}\,e\,\left(3\,c^{3/2}\,d^3+27\,i\,\sqrt{a}\,c\,d^2\,e-29\,a\,\sqrt{c}\,d\,e^2-5\,i\,a^{3/2}\,e^3\right)\,\sqrt{\frac{e\,\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

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

Problem 692: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(d+e\,x\right)^{9/2}}{\left(a+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 475 leaves, 8 steps):

$$-\frac{(a e-c d x)(d+e x)^{7/2}}{3 a c \left(a+c x^2\right)^{3/2}}-\frac{(d+e x)^{3/2}\left(a e\left(c d^2+7 a e^2\right)-2 c d\left(2 c d^2+5 a e^2\right) x\right)}{6 a^2 c^2 \sqrt{a+c x^2}}-\frac{2 d e\left(c d^2+3 a e^2\right) \sqrt{d+e x} \sqrt{a+c x^2}}{3 a^2 c^2}+$$

$$\left(\left(4 c^2 d^4+15 a c d^2 e^2-21 a^2 e^4\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c} x}{\sqrt{-a}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2 a e}{\sqrt{-a} \sqrt{c} d-a e}\right]\right) \Big/ \left(6 (-a)^{3/2} c^{5/2} \sqrt{\frac{\sqrt{c} (d+e x)}{\sqrt{c} d+\sqrt{-a} e}} \sqrt{a+c x^2}\right)-$$

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

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

Result (type 4, 851 leaves) :

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

$$\left.\frac{a\,c\,d^3\,e-27\,a^2\,d\,e^3+4\,c^2\,d^4\,x+15\,a\,c\,d^2\,e^2\,x-9\,a^2\,e^4\,x}{6\,a^2\,c^2\,\left(a+c\,x^2\right)}\right)+$$

$$\frac{1}{12\,a^2\,c^3\,e\,\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}\,\sqrt{a+\frac{c\,(d+e\,x)^2\,\left(-1+\frac{d}{d+e\,x}\right)^2}{e^2}}}$$

$$\left(d+e\,x\right)^{3/2}\left(2\,\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(\frac{21\,a^3\,e^6}{\left(d+e\,x\right)^2}+3\,a^2\,c\,e^4\,\left(7+\frac{2\,d^2}{\left(d+e\,x\right)^2}-\frac{14\,d}{d+e\,x}\right)-\right.\right.$$

$$\left.4\,c^3\,d^4\,\left(-1+\frac{d}{d+e\,x}\right)^2+a\,c^2\,d^2\,e^2\,\left(-15-\frac{19\,d^2}{\left(d+e\,x\right)^2}+\frac{30\,d}{d+e\,x}\right)\right)+\frac{1}{\sqrt{d+e\,x}}$$

$$2\,\sqrt{c}\,\left(4\,\mathrm{i}\,c^{5/2}\,d^5-4\,\sqrt{a}\,c^2\,d^4\,e+15\,\mathrm{i}\,a\,c^{3/2}\,d^3\,e^2-15\,a^{3/2}\,c\,d^2\,e^3-21\,\mathrm{i}\,a^2\,\sqrt{c}\,d\,e^4+21\,a^{5/2}\,e^5\right)$$

$$\sqrt{1-\frac{d}{d+e\,x}-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,\left(d+e\,x\right)}}\,\sqrt{1-\frac{d}{d+e\,x}+\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,\left(d+e\,x\right)}}$$

$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e}\right]+\frac{1}{\sqrt{d+e\,x}}$$

$$2\,\sqrt{a}\,\sqrt{c}\,e\,\left(4\,c^2\,d^4+\mathrm{i}\,\sqrt{a}\,c^{3/2}\,d^3\,e+15\,a\,c\,d^2\,e^2+33\,\mathrm{i}\,a^{3/2}\,\sqrt{c}\,d\,e^3-21\,a^2\,e^4\right)$$

$$\sqrt{1-\frac{d}{d+e\,x}-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,\left(d+e\,x\right)}}\,\sqrt{1-\frac{d}{d+e\,x}+\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,\left(d+e\,x\right)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e}\right]\right)$$

Problem 693: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(d+e\,x\right)^{7/2}}{\left(a+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 418 leaves, 7 steps):

$$-\frac{\left(a\,e-c\,d\,x\right)\,\left(d+e\,x\right)^{5/2}}{3\,a\,c\,\left(a+c\,x^2\right)^{3/2}}-\frac{\sqrt{d+e\,x}\,\left(a\,e\,\left(3\,c\,d^2+5\,a\,e^2\right)-2\,c\,d\,\left(2\,c\,d^2+3\,a\,e^2\right)\,x\right)}{6\,a^2\,c^2\,\sqrt{a+c\,x^2}}+$$

$$\left(2\,d\,\left(c\,d^2+2\,a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{1+\frac{c\,x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2\,a\,e}{\sqrt{-a}\,\sqrt{c}\,d-a\,e}\right]\right)\Bigg/$$

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

$$\left(\left(c\,d^2+a\,e^2\right)\,\left(4\,c\,d^2+5\,a\,e^2\right)\,\sqrt{\frac{\sqrt{c}\,\left(d+e\,x\right)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\,\sqrt{1+\frac{c\,x^2}{a}}\right.$$

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

Result (type 4, 627 leaves) :

$$\frac{1}{6\sqrt{a+c x^2}}\sqrt{d+e x}\left(\frac{1}{a^2 c^2 \left(a+c x^2\right)}\left(-5 a^3 e^3+4 c^3 d^3 x^3+a^2 c e \left(-5 d^2+2 d e x-7 e^2 x^2\right)+a c^2 d x \left(6 d^2+d e x+8 e^2 x^2\right)\right)-\frac{1}{a^2 c^2 e \sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}} (d+e x)}\left(4 d e^2 \sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}} \left(2 a^2 e^2+c^2 d^2 x^2+a c \left(d^2+2 e^2 x^2\right)\right)+4 \sqrt{c} d \left(-i c^{3/2} d^3+\sqrt{a} c d^2 e-2 i a \sqrt{c} d e^2+2 a^{3/2} e^3\right) \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}} \sqrt{-\frac{\frac{i \sqrt{a} e}{\sqrt{c}}-e x}{d+e x}} (d+e x)^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}}}{\sqrt{d+e x}}\right], \frac{\sqrt{c} d-i \sqrt{a} e}{\sqrt{c} d+i \sqrt{a} e}\right]-\sqrt{a} e \left(4 c^{3/2} d^3+i \sqrt{a} c d^2 e+8 a \sqrt{c} d e^2+5 i a^{3/2} e^3\right) \sqrt{\frac{e \left(\frac{i \sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}} \sqrt{-\frac{\frac{i \sqrt{a} e}{\sqrt{c}}-e x}{d+e x}} (d+e x)^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i \sqrt{a} e}{\sqrt{c}}}}{\sqrt{d+e x}}\right], \frac{\sqrt{c} d-i \sqrt{a} e}{\sqrt{c} d+i \sqrt{a} e}\right]\right)\right)$$

Problem 694: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^{5/2}}{\left(a+c x^2\right)^{5/2}} \, dx$$

Optimal (type 4, 392 leaves, 7 steps):

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

Result (type 4, 597 leaves) :

$$\frac{1}{12\sqrt{a+c x^2}}\sqrt{d+e x}\left(\frac{2\left(4 c^2 d^2 x^3+a^2 e\left(-3 d+e x\right)+a c x\left(6 d^2+d e x+3 e^2 x^2\right)\right)}{a^2 c\left(a+c x^2\right)}+\right.$$

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

$$2 i\sqrt{c}\left(4 c^{3/2} d^3+4 i\sqrt{a}\,c d^2 e+3 a\sqrt{c}\,d e^2+3 i a^{3/2} e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}$$

$$\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e x}{d+e x}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+\frac{1}{\sqrt{d+e x}}$$

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

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\middle/\left(a^2 c^2 e\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\right)\right)$$

Problem 695: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 368 leaves, 7 steps):

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

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

Result (type 4, 504 leaves):

$$\frac{1}{12\sqrt{a+c x^2}}\sqrt{d+e x}\left(\frac{-2 a^2 e+8 c^2 d x^3+2 a c x(6 d+e x)}{a^2 c\left(a+c x^2\right)}+\right.$$

$$\left((d+e x)\left(-\frac{8 d e^2\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(a+c x^2\right)}{(d+e x)^2}+\frac{1}{\sqrt{d+e x}}8 i\sqrt{c}\,d\left(\sqrt{c}\,d+i\sqrt{a}\,e\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}\right.\right.$$

$$\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e x}{d+e x}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+$$

$$\frac{1}{\sqrt{d+e x}}2\sqrt{a}\,e\left(4\sqrt{c}\,d+i\sqrt{a}\,e\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e x}{d+e x}}$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\Big/\left(a^2 c e\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\right)\right)$$

Problem 696: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d+e\,x}}{\left(a+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 392 leaves, 7 steps):

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

Result (type 4, 619 leaves):

$$\frac{1}{12\sqrt{a+c\,x^2}}\sqrt{d+e\,x}\left(\frac{2\left(4\,c^2\,d^2\,x^3+a^2\,e\,(d+5\,e\,x)+a\,c\,x\left(6\,d^2+d\,e\,x+3\,e^2\,x^2\right)\right)}{a^2\left(c\,d^2+a\,e^2\right)\left(a+c\,x^2\right)}+\right.$$

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

$$2\,i\sqrt{c}\left(4\,c^{3/2}\,d^3+4\,i\sqrt{a}\,c\,d^2\,e+3\,a\sqrt{c}\,d\,e^2+3\,i\,a^{3/2}\,e^3\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

$$\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]+\frac{1}{\sqrt{d+e\,x}}$$

$$2\sqrt{a}\sqrt{c}\,e\left(4\,c\,d^2+i\sqrt{a}\sqrt{c}\,d\,e+3\,a\,e^2\right)\sqrt{\frac{e\left(\frac{i\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\sqrt{-\frac{\frac{i\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\;\text{EllipticF}\Bigg[$$

$$\left.\left.\left.i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{\sqrt{c}\,d+i\sqrt{a}\,e}\right]\right)\right)\Bigg/\left(a^2\,c\,e\sqrt{-d-\frac{i\sqrt{a}\,e}{\sqrt{c}}}\left(c\,d^2+a\,e^2\right)\right)\right)$$

Problem 697: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{d+e\,x}\left(a+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 450 leaves, 7 steps):

$$\frac{(a e+c d x)\sqrt{d+e x}}{3 a\left(c d^2+a e^2\right)\left(a+c x^2\right)^{3/2}}+\frac{\sqrt{d+e x}\left(a e\left(c d^2+5 a e^2\right)+4 c d\left(c d^2+2 a e^2\right)x\right)}{6 a^2\left(c d^2+a e^2\right)^2\sqrt{a+c x^2}}+$$

$$\left(2\sqrt{c}\,d\left(c d^2+2 a e^2\right)\sqrt{d+e x}\sqrt{1+\frac{c x^2}{a}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a}\sqrt{c}\,d-a e}\right]\right)\Big/$$

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

$$\left(\left(4 c d^2+5 a e^2\right)\sqrt{\frac{\sqrt{c}\,(d+e x)}{\sqrt{c}\,d+\sqrt{-a}\,e}}\sqrt{1+\frac{c x^2}{a}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\,x}{\sqrt{-a}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2 a e}{\sqrt{-a}\sqrt{c}\,d-a e}\right]\right)\Big/\left(6(-a)^{3/2}\sqrt{c}\left(c d^2+a e^2\right)\sqrt{d+e x}\sqrt{a+c x^2}\right)$$

Result (type 4, 570 leaves) :

$$\frac{1}{6\,a^2\,\left(c\,d^2+a\,e^2\right)^2\,\sqrt{a+c\,x^2}}$$

$$\sqrt{d+e\,x}\,\left(a\,c\,d^2\,e+5\,a^2\,e^3+4\,c^2\,d^3\,x+8\,a\,c\,d\,e^2\,x+\frac{2\,a\,\left(c\,d^2+a\,e^2\right)\,\left(a\,e+c\,d\,x\right)}{a+c\,x^2}-\right.$$

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

$$4\,i\,c\,d\,\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(c\,d^2+2\,a\,e^2\right)\,\sqrt{\frac{e\,\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{i\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,\sqrt{d+e\,x}$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-i\,\sqrt{a}\,e}{\sqrt{c}\,d+i\,\sqrt{a}\,e}\right]+\frac{1}{\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}}$$

$$\sqrt{a}\,\left(4\,c^{3/2}\,d^3+i\,\sqrt{a}\,c\,d^2\,e+8\,a\,\sqrt{c}\,d\,e^2+5\,i\,a^{3/2}\,e^3\right)\,\sqrt{\frac{e\,\left(\frac{i\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{i\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}$$

$$\left.\sqrt{d+e\,x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-d-\frac{i\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-i\,\sqrt{a}\,e}{\sqrt{c}\,d+i\,\sqrt{a}\,e}\right]\right)$$

Problem 698: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 532 leaves, 8 steps):

$$\frac{a e+c d x}{3 a \left(c d^2+a e^2\right) \sqrt{d+e x} \left(a+c x^2\right)^{3/2}}-\frac{a e \left(c d^2-7 a e^2\right)-4 c d \left(c d^2+3 a e^2\right) x}{6 a^2 \left(c d^2+a e^2\right)^2 \sqrt{d+e x} \sqrt{a+c x^2}}+\frac{e \left(4 c^2 d^4+15 a c d^2 e^2-21 a^2 e^4\right) \sqrt{a+c x^2}}{6 a^2 \left(c d^2+a e^2\right)^3 \sqrt{d+e x}}+$$

$$\left(\sqrt{c} \left(4 c^2 d^4+15 a c d^2 e^2-21 a^2 e^4\right) \sqrt{d+e x} \sqrt{1+\frac{c x^2}{a}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{c}\, x}{\sqrt{-a}}}}{\sqrt{2}}\right],-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/$$

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

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

$$\left.\left.-\frac{2 a e}{\sqrt{-a} \sqrt{c}\, d-a e}\right]\right)\Big/\left(3 (-a)^{3/2} \left(c d^2+a e^2\right)^2 \sqrt{d+e x} \sqrt{a+c x^2}\right)$$

Result (type 4, 669 leaves) :

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

$$\Bigg(21\,a^3\,e^5-4\,c^3\,d^4\,e\,x^2-12\,a^2\,e^5\,\left(a+c\,x^2\right)+3\,a^2\,c\,e^3\,\left(-5\,d^2+7\,e^2\,x^2\right)-$$

$$a\,c^2\,d^2\,e\,\left(4\,d^2+15\,e^2\,x^2\right)+\frac{2\,a\,c\,\left(c\,d^2+a\,e^2\right)\,\left(d+e\,x\right)\,\left(c\,d^2\,x+a\,e\,\left(2\,d-e\,x\right)\right)}{a+c\,x^2}+$$

$$c\,\left(d+e\,x\right)\,\left(4\,c^2\,d^4\,x+3\,a^2\,e^3\,\left(7\,d-3\,e\,x\right)+a\,c\,d^2\,e\,\left(d+15\,e\,x\right)\right)-\frac{1}{e}$$

$$\mathrm{i}\,c\,\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}\,\left(4\,c^2\,d^4+15\,a\,c\,d^2\,e^2-21\,a^2\,e^4\right)\,\sqrt{\frac{e\,\left(\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}\,\sqrt{-\frac{\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}$$

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

$$\sqrt{a}\,\sqrt{c}\,\left(4\,c^2\,d^4+\mathrm{i}\,\sqrt{a}\,c^{3/2}\,d^3\,e+15\,a\,c\,d^2\,e^2+33\,\mathrm{i}\,a^{3/2}\,\sqrt{c}\,d\,e^3-21\,a^2\,e^4\right)\,\sqrt{\frac{e\,\left(\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{c}}+x\right)}{d+e\,x}}$$

$$\sqrt{-\frac{\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}-e\,x}{d+e\,x}}\,\left(d+e\,x\right)^{3/2}\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{-d-\frac{\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}}}}{\sqrt{d+e\,x}}\right],\,\frac{\sqrt{c}\,d-\mathrm{i}\,\sqrt{a}\,e}{\sqrt{c}\,d+\mathrm{i}\,\sqrt{a}\,e}\right]\Bigg)$$

Problem 699: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 151 leaves, 1 step):

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

$$\frac{\mathrm{Log}\left[3\,d\,e^2-3\,e^3\,x-3\times 2^{1/3}\,d^{1/3}\,e^2\,\left(d^2+3\,e^2\,x^2\right)^{1/3}\right]}{2\times 2^{2/3}\,d^{2/3}\,e}$$

Result (type 6, 176 leaves):

$$-\left(\left(\left(\frac{e\left(\sqrt{3}\sqrt{-\frac{d^2}{e^2}}+3x\right)}{d+e x}\right)^{1/3}\left(\frac{e\left(-3\sqrt{3}\sqrt{-\frac{d^2}{e^2}}+9x\right)}{d+e x}\right)^{1/3}\right.\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{3d-\sqrt{3}\sqrt{-\frac{d^2}{e^2}}\,e}{3d+3e x},\frac{3d+\sqrt{3}\sqrt{-\frac{d^2}{e^2}}\,e}{3d+3e x}\right]\right)\bigg/\left(2e\left(d^2+3e^2x^2\right)^{1/3}\right)\right)$$

Problem 700: Result unnecessarily involves higher level functions.

$$\int\frac{(2+3x)^3}{\left(4+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 558 leaves, 6 steps):

$$\frac{1}{30}(2+3x)^2\left(4+27x^2\right)^{2/3}+\frac{4}{35}(7+4x)\left(4+27x^2\right)^{2/3}-\frac{96x}{7\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)}+$$

$$\left(16\times 2^{1/3}\sqrt{2+\sqrt{3}}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

$$\left(21\times 3^{3/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(32\times 2^{5/6}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

$$\left(63\times 3^{1/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 97 leaves):

$$\frac{1}{210\left(4+27x^2\right)^{1/3}}\left(784+720x+5544x^2+4860x^3+1701x^4+80\times 6^{1/3}\left(2\sqrt{3}-9\,\mathrm{i}\,x\right)^{1/3}\left(-2\,\mathrm{i}+3\sqrt{3}\,x\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{1}{2}+\frac{3}{4}\,\mathrm{i}\sqrt{3}\,x\right]\right)$$

Problem 701: Result unnecessarily involves higher level functions.

$$\int\frac{(2+3x)^2}{\left(4+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 551 leaves, 6 steps):

$$\frac{5}{21}\left(4+27x^2\right)^{2/3}+\frac{1}{21}(2+3x)\left(4+27x^2\right)^{2/3}-\frac{72x}{7\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)}+$$
$$\left(4\times 2^{1/3}\sqrt{2+\sqrt{3}}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(7\times 3^{3/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)-$$
$$\left(8\times 2^{5/6}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(21\times 3^{1/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 92 leaves):

$$\frac{1}{21\left(4+27x^2\right)^{1/3}}\left(28+12x+189x^2+81x^3+6\times 6^{1/3}\left(2\sqrt{3}-9\,\mathrm{i}\,x\right)^{1/3}\left(-2\,\mathrm{i}+3\sqrt{3}\,x\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{1}{2}+\frac{3}{4}\,\mathrm{i}\sqrt{3}\,x\right]\right)$$

Problem 702: Result unnecessarily involves higher level functions.

$$\int \frac{2+3x}{\left(4+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 529 leaves, 5 steps):

$$\frac{1}{12}\left(4+27x^2\right)^{2/3}-\frac{6x}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}+\left(2^{1/3}\sqrt{2+\sqrt{3}}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(3\times 3^{3/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)-\left(2\times 2^{5/6}\left(2^{2/3}-\left(4+27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4+27x^2\right)^{1/3}+\left(4+27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(9\times 3^{1/4}x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 40 leaves):

$$\frac{1}{12}\left(4+27x^2\right)^{2/3}+2^{1/3}\,x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{27x^2}{4}\right]$$

Problem 703: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{(2+3x)\left(4+27x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 97 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}(2-3x)}{\sqrt{3}\left(4+27x^2\right)^{1/3}}\right]}{6\times 2^{1/3}\sqrt{3}}-\frac{\text{Log}[2+3x]}{12\times 2^{1/3}}+\frac{\text{Log}\left[54-81x-27\times 2^{2/3}\left(4+27x^2\right)^{1/3}\right]}{12\times 2^{1/3}}$$

Result (type 6, 285 leaves):

$$-\left(\left(5\,(2+3\,x)\left(-2\,i\,\sqrt{3}+9\,x\right)\left(2\,i\,\sqrt{3}+9\,x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,i\,\sqrt{3}}{6+9\,x},\frac{6+2\,i\,\sqrt{3}}{6+9\,x}\right]\right)\Big/\left(2\,(4+27\,x^2)^{4/3}\left(15\,(2+3\,x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,i\,\sqrt{3}}{6+9\,x},\frac{6+2\,i\,\sqrt{3}}{6+9\,x}\right]+\left(6+2\,i\,\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{6-2\,i\,\sqrt{3}}{6+9\,x},\frac{6+2\,i\,\sqrt{3}}{6+9\,x}\right]+2\left(3-i\,\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{6-2\,i\,\sqrt{3}}{6+9\,x},\frac{6+2\,i\,\sqrt{3}}{6+9\,x}\right]\right)\right)\right)$$

Problem 704: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(2+3\,x)^2\,(4+27\,x^2)^{1/3}}\,dx$$

Optimal (type 4, 634 leaves, 7 steps):

$$-\frac{(4+27\,x^2)^{2/3}}{48\,(2+3\,x)}-\frac{3\,x}{16\left(2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}\,(2-3\,x)}{\sqrt{3}\,(4+27\,x^2)^{1/3}}\right]}{24\times 2^{1/3}\,\sqrt{3}}+\left(\sqrt{2+\sqrt{3}}\left(2^{2/3}-(4+27\,x^2)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\,(4+27\,x^2)^{1/3}+(4+27\,x^2)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-(4+27\,x^2)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}}\right],-7+4\,\sqrt{3}\right]\right)\Big/\left(48\times 2^{2/3}\times 3^{3/4}\,x\,\sqrt{-\frac{2^{2/3}-(4+27\,x^2)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}\right)^2}}\right)-\left(\left(2^{2/3}-(4+27\,x^2)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\,(4+27\,x^2)^{1/3}+(4+27\,x^2)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-(4+27\,x^2)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}}\right],-7+4\,\sqrt{3}\right]\right)\Big/\left(72\times 2^{1/6}\times 3^{1/4}\,x\,\sqrt{-\frac{2^{2/3}-(4+27\,x^2)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-(4+27\,x^2)^{1/3}\right)^2}}\right)-\frac{\text{Log}[2+3\,x]}{48\times 2^{1/3}}+\frac{\text{Log}\left[54-81\,x-27\times 2^{2/3}\,(4+27\,x^2)^{1/3}\right]}{48\times 2^{1/3}}$$

Result (type 6, 376 leaves):

$$\left(-\frac{36\left(4+27x^2\right)^2}{2+3x}-\left(1080\,(2+3x)\left(-2\,\mathrm{i}\sqrt{3}+9x\right)\left(2\,\mathrm{i}\sqrt{3}+9x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,\mathrm{i}\sqrt{3}}{6+9x},\frac{6+2\,\mathrm{i}\sqrt{3}}{6+9x}\right]\right)\Big/\left(15\,(2+3x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,\mathrm{i}\sqrt{3}}{6+9x},\frac{6+2\,\mathrm{i}\sqrt{3}}{6+9x}\right]+\left(6+2\,\mathrm{i}\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{6-2\,\mathrm{i}\sqrt{3}}{6+9x},\frac{6+2\,\mathrm{i}\sqrt{3}}{6+9x}\right]+2\left(3-\mathrm{i}\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{6-2\,\mathrm{i}\sqrt{3}}{6+9x},\frac{6+2\,\mathrm{i}\sqrt{3}}{6+9x}\right]\right)+3\times 3^{5/6}\left(4\sqrt{3}-18\,\mathrm{i}\,x\right)^{1/3}\left(-2\,\mathrm{i}\sqrt{3}+9x\right)\left(4+27x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{1}{2}+\frac{3}{4}\,\mathrm{i}\sqrt{3}\,x\right]\right)\Big/\left(1728\left(4+27x^2\right)^{4/3}\right)$$

Problem 705: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(2+3x)^3\left(4+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 656 leaves, 8 steps):

$$-\frac{\left(4+27x^2\right)^{2/3}}{96\,(2+3x)^2}-\frac{\left(4+27x^2\right)^{2/3}}{96\,(2+3x)}-\frac{3x}{32\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}(2-3x)}{\sqrt{3}\,(4+27x^2)^{1/3}}\right]}{96\times 2^{1/3}\sqrt{3}}+$$

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(96\times 2^{2/3}\times 3^{3/4}\,x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)-$$

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

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(144\times 2^{1/6}\times 3^{1/4}\,x\sqrt{-\frac{2^{2/3}-\left(4+27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4+27x^2\right)^{1/3}\right)^2}}\right)-$$

$$\frac{\text{Log}[2+3x]}{192\times 2^{1/3}}+\frac{\text{Log}\left[54-81x-27\times 2^{2/3}\left(4+27x^2\right)^{1/3}\right]}{192\times 2^{1/3}}$$

Result (type 6, 379 leaves):

$$\left(-\frac{108\,(1+x)\left(4+27x^2\right)^2}{(2+3x)^2}-\left(540\,(2+3x)\left(-2\,i\sqrt{3}+9x\right)\right.\right.$$

$$\left.\left(2\,i\sqrt{3}+9x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,i\sqrt{3}}{6+9x},\frac{6+2\,i\sqrt{3}}{6+9x}\right]\right)\Bigg/$$

$$\left(15\,(2+3x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{6-2\,i\sqrt{3}}{6+9x},\frac{6+2\,i\sqrt{3}}{6+9x}\right]+\right.$$

$$\left(6+2\,i\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{6-2\,i\sqrt{3}}{6+9x},\frac{6+2\,i\sqrt{3}}{6+9x}\right]+$$

$$\left.2\left(3-i\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{6-2\,i\sqrt{3}}{6+9x},\frac{6+2\,i\sqrt{3}}{6+9x}\right]\right)+$$

$$3\times 3^{5/6}\left(4\sqrt{3}-18\,i\,x\right)^{1/3}\left(-2\,i\sqrt{3}+9x\right)\left(4+27x^2\right)$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{1}{2}+\frac{3}{4}\,i\sqrt{3}\,x\right]\right)\Bigg/\left(3456\left(4+27x^2\right)^{4/3}\right)$$

Problem 706: Result unnecessarily involves higher level functions.

$$\int \frac{(2+3\,i\,x)^3}{\left(4-27\,x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 564 leaves, 6 steps):

$$-\frac{4}{35}\,(7\,i-4\,x)\,\left(4-27\,x^2\right)^{2/3}-\frac{1}{30}\,i\,(2+3\,i\,x)^2\,\left(4-27\,x^2\right)^{2/3}-\frac{96\,x}{7\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)}-$$
$$\left(16\times 2^{1/3}\sqrt{2+\sqrt{3}}\,\left(2^{2/3}-\left(4-27\,x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4-27\,x^2\right)^{1/3}+\left(4-27\,x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$
$$\left(21\times 3^{3/4}\,x\,\sqrt{-\frac{2^{2/3}-\left(4-27\,x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(32\times 2^{5/6}\left(2^{2/3}-\left(4-27\,x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4-27\,x^2\right)^{1/3}+\left(4-27\,x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$
$$\left(63\times 3^{1/4}\,x\,\sqrt{-\frac{2^{2/3}-\left(4-27\,x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 60 leaves):

$$\left(4-27\,x^2\right)^{2/3}\left(-\frac{14\,i}{15}+\frac{6\,x}{7}+\frac{3\,i\,x^2}{10}\right)+\frac{16}{7}\times 2^{1/3}\,x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{27\,x^2}{4}\right]$$

Problem 707: Result unnecessarily involves higher level functions.

$$\int \frac{(2+3\,i\,x)^2}{\left(4-27\,x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 557 leaves, 6 steps):

$$-\frac{5}{21}\,i\,\left(4-27\,x^2\right)^{2/3}-\frac{1}{21}\,i\,\left(2+3\,i\,x\right)\,\left(4-27\,x^2\right)^{2/3}-\frac{72\,x}{7\,\left(2^{2/3}\,\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)}-$$

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

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

$$\left(7\times 3^{3/4}\,x\,\sqrt{-\frac{2^{2/3}-\left(4-27\,x^2\right)^{1/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(8\times 2^{5/6}\,\left(2^{2/3}-\left(4-27\,x^2\right)^{1/3}\right)\,\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\,\left(4-27\,x^2\right)^{1/3}+\left(4-27\,x^2\right)^{2/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right.$$

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

$$\left(21\times 3^{1/4}\,x\,\sqrt{-\frac{2^{2/3}-\left(4-27\,x^2\right)^{1/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-\left(4-27\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 51 leaves):

$$\left(-\frac{i}{3}+\frac{x}{7}\right)\,\left(4-27\,x^2\right)^{2/3}+\frac{12}{7}\times 2^{1/3}\,x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,\frac{27\,x^2}{4}\right]$$

Problem 708: Result unnecessarily involves higher level functions.

$$\int\frac{2+3\,i\,x}{\left(4-27\,x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 531 leaves, 5 steps):

$$-\frac{1}{12}\,i\,\left(4-27x^2\right)^{2/3}-\frac{6x}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}-$$

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

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

$$\left(2\times 2^{5/6}\left(2^{2/3}-\left(4-27x^2\right)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\left(4-27x^2\right)^{1/3}+\left(4-27x^2\right)^{2/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

$$\left(9\times 3^{1/4}\,x\,\sqrt{-\frac{2^{2/3}-\left(4-27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 42 leaves):

$$-\frac{1}{12}\,i\,\left(4-27x^2\right)^{2/3}+2^{1/3}\,x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{27x^2}{4}\right]$$

Problem 709: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(2+3\,i\,x\right)\left(4-27x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 109 leaves, 1 step):

$$\frac{i\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}\left(2-3\,i\,x\right)}{\sqrt{3}\left(4-27x^2\right)^{1/3}}\right]}{6\times 2^{1/3}\sqrt{3}}+\frac{i\,\text{Log}\left[2+3\,i\,x\right]}{12\times 2^{1/3}}-\frac{i\,\text{Log}\left[-54+81\,i\,x+27\times 2^{2/3}\left(4-27x^2\right)^{1/3}\right]}{12\times 2^{1/3}}$$

Result (type 6, 125 leaves):

$$\left(i\left(\frac{2\sqrt{3}-9x}{2\,i-3x}\right)^{1/3}\left(\frac{2\sqrt{3}+9x}{-2\,i+3x}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{2\left(3\,i+\sqrt{3}\right)}{6\,i-9x},\frac{2\left(-3\,i+\sqrt{3}\right)}{-6\,i+9x}\right]\right)\bigg/$$

$$\left(2\times 3^{2/3}\left(4-27x^2\right)^{1/3}\right)$$

Problem 710: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(2+3\,i\,x)^2\,(4-27\,x^2)^{1/3}}\,dx$$

Optimal (type 4, 650 leaves, 7 steps):

$$\frac{i\,(4-27\,x^2)^{2/3}}{48\,(2+3\,i\,x)}-\frac{3\,x}{16\,\left(2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}\right)}+\frac{i\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}\,(2-3\,i\,x)}{\sqrt{3}\,(4-27\,x^2)^{1/3}}\right]}{24\times 2^{1/3}\,\sqrt{3}}-$$
$$\left(\sqrt{2+\sqrt{3}}\,\left(2^{2/3}-(4-27\,x^2)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\,(4-27\,x^2)^{1/3}+(4-27\,x^2)^{2/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\,\left(1+\sqrt{3}\right)-(4-27\,x^2)^{1/3}}{2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$
$$\left(48\times 2^{2/3}\times 3^{3/4}\,x\,\sqrt{-\frac{2^{2/3}-(4-27\,x^2)^{1/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}\right)^2}}\right)+$$
$$\left(\left(2^{2/3}-(4-27\,x^2)^{1/3}\right)\sqrt{\frac{2\times 2^{1/3}+2^{2/3}\,(4-27\,x^2)^{1/3}+(4-27\,x^2)^{2/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\,\left(1+\sqrt{3}\right)-(4-27\,x^2)^{1/3}}{2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$
$$\left(72\times 2^{1/6}\times 3^{1/4}\,x\,\sqrt{-\frac{2^{2/3}-(4-27\,x^2)^{1/3}}{\left(2^{2/3}\,\left(1-\sqrt{3}\right)-(4-27\,x^2)^{1/3}\right)^2}}\right)+$$
$$\frac{i\,\text{Log}[2+3\,i\,x]}{48\times 2^{1/3}}-\frac{i\,\text{Log}\left[-54+81\,i\,x+27\times 2^{2/3}\,(4-27\,x^2)^{1/3}\right]}{48\times 2^{1/3}}$$

Result (type 6, 132 leaves):

$$\frac{\left(\frac{2\sqrt{3}-9\,x}{2\,i-3\,x}\right)^{1/3}\left(\frac{2\sqrt{3}+9\,x}{-2\,i+3\,x}\right)^{1/3}\text{AppellF1}\left[\frac{5}{3},\,\frac{1}{3},\,\frac{1}{3},\,\frac{8}{3},\,\frac{2\,\left(3\,i+\sqrt{3}\right)}{6\,i-9\,x},\,\frac{2\,\left(-3\,i+\sqrt{3}\right)}{-6\,i+9\,x}\right]}{5\times 3^{2/3}\,(-2\,i+3\,x)\,(4-27\,x^2)^{1/3}}$$

Problem 711: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(2+3\,i\,x)^3\,(4-27\,x^2)^{1/3}}\,dx$$

Optimal (type 4, 676 leaves, 8 steps):

$$\frac{i\left(4-27x^2\right)^{2/3}}{96\left(2+3ix\right)^2}+\frac{i\left(4-27x^2\right)^{2/3}}{96\left(2+3ix\right)}-$$

$$\frac{3x}{32\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}\right)}+\frac{i\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{1/3}(2-3ix)}{\sqrt{3}\left(4-27x^2\right)^{1/3}}\right]}{96\times 2^{1/3}\sqrt{3}}-$$

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(96\times 2^{2/3}\times 3^{3/4}x\sqrt{-\frac{2^{2/3}-\left(4-27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}\right)^2}}\right)+$$

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

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{2/3}\left(1+\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}{2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(144\times 2^{1/6}\times 3^{1/4}x\sqrt{-\frac{2^{2/3}-\left(4-27x^2\right)^{1/3}}{\left(2^{2/3}\left(1-\sqrt{3}\right)-\left(4-27x^2\right)^{1/3}\right)^2}}\right)+$$

$$\frac{i\,\text{Log}[2+3ix]}{192\times 2^{1/3}}-\frac{i\,\text{Log}\left[-54+81ix+27\times 2^{2/3}\left(4-27x^2\right)^{1/3}\right]}{192\times 2^{1/3}}$$

Result (type 6, 134 leaves):

$$-\left(\left(i\left(\frac{2\sqrt{3}-9x}{2i-3x}\right)^{1/3}\left(\frac{2\sqrt{3}+9x}{-2i+3x}\right)^{1/3}\text{AppellF1}\left[\frac{8}{3},\frac{1}{3},\frac{1}{3},\frac{11}{3},\frac{2\left(3i+\sqrt{3}\right)}{6i-9x},\frac{2\left(-3i+\sqrt{3}\right)}{-6i+9x}\right]\right)\Bigg/\right.$$

$$\left.\left(8\times 3^{2/3}(2i-3x)^2\left(4-27x^2\right)^{1/3}\right)\right)$$

Problem 712: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 104 leaves, 1 step):

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

Result (type 6, 256 leaves):

$$-\left(\left(15\left(\sqrt{3}+x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{-i+\sqrt{3}}{\sqrt{3}+x},\frac{i+\sqrt{3}}{\sqrt{3}+x}\right]\right)\Big/\right.$$
$$\left(2\left(1+x^2\right)^{1/3}\left(5\left(\sqrt{3}+x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{-i+\sqrt{3}}{\sqrt{3}+x},\frac{i+\sqrt{3}}{\sqrt{3}+x}\right]+\right.\right.$$
$$\left(i+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{-i+\sqrt{3}}{\sqrt{3}+x},\frac{i+\sqrt{3}}{\sqrt{3}+x}\right]+$$
$$\left.\left.\left.\left(-i+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{-i+\sqrt{3}}{\sqrt{3}+x},\frac{i+\sqrt{3}}{\sqrt{3}+x}\right]\right)\right)\right)$$

Problem 713: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 101 leaves, 1 step):

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

Result (type 6, 276 leaves):

$$-\left(\left(15\left(-\sqrt{3}+x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{-i+\sqrt{3}}{\sqrt{3}-x},\frac{i+\sqrt{3}}{\sqrt{3}-x}\right]\right)\Big/\right.$$
$$\left(2\left(1+x^2\right)^{1/3}\left(5\left(\sqrt{3}-x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{-i+\sqrt{3}}{\sqrt{3}-x},\frac{i+\sqrt{3}}{\sqrt{3}-x}\right]+\right.\right.$$
$$\left(i+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{-i+\sqrt{3}}{\sqrt{3}-x},\frac{i+\sqrt{3}}{\sqrt{3}-x}\right]+$$
$$\left.\left.\left.\left(-i+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{-i+\sqrt{3}}{\sqrt{3}-x},\frac{i+\sqrt{3}}{\sqrt{3}-x}\right]\right)\right)\right)$$

Problem 714: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 78 leaves, 2 steps):

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

Result (type 6, 139 leaves):

$$\left(15\,(-3+x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{4}{-3+x},-\frac{2}{-3+x}\right]\right)\Big/\left(2\,(1-x^2)^{1/3}\left(5\,(-3+x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{4}{-3+x},-\frac{2}{-3+x}\right]-2\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},-\frac{4}{-3+x},-\frac{2}{-3+x}\right]+2\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},-\frac{4}{-3+x},-\frac{2}{-3+x}\right]\right)\right)\right)$$

Problem 715: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 76 leaves, 2 steps):

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

Result (type 6, 139 leaves):

$$-\left(\left(15\,(3+x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{4}{3+x},\frac{2}{3+x}\right]\right)\Big/\left(2\,(1-x^2)^{1/3}\left(5\,(3+x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{4}{3+x},\frac{2}{3+x}\right]+2\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{4}{3+x},\frac{2}{3+x}\right]+2\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{4}{3+x},\frac{2}{3+x}\right]\right)\right)\right)\right)$$

Problem 716: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+e\,x)\,(d^2-9\,e^2\,x^2)^{1/3}}\,dx$$

Optimal (type 3, 206 leaves, 3 steps):

$$\frac{\sqrt{3}\left(1-\frac{9\,e^2\,x^2}{d^2}\right)^{1/3}\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{\left(1-\frac{3\,e\,x}{d}\right)^{2/3}}{\sqrt{3}\left(1+\frac{3\,e\,x}{d}\right)^{1/3}}\right]}{4\,e\,(d^2-9\,e^2\,x^2)^{1/3}}+\frac{\left(1-\frac{9\,e^2\,x^2}{d^2}\right)^{1/3}\text{Log}[d+e\,x]}{4\,e\,(d^2-9\,e^2\,x^2)^{1/3}}-\frac{3\left(1-\frac{9\,e^2\,x^2}{d^2}\right)^{1/3}\text{Log}\left[-\frac{1}{2}\left(1-\frac{3\,e\,x}{d}\right)^{2/3}-\left(1+\frac{3\,e\,x}{d}\right)^{1/3}\right]}{8\,e\,(d^2-9\,e^2\,x^2)^{1/3}}$$

Result (type 6, 155 leaves):

$$-\left(\left(3^{1/3}\left(-\frac{e\left(\sqrt{\frac{d^2}{e^2}}-3x\right)}{d+e x}\right)^{1/3}\left(\frac{e\left(\sqrt{\frac{d^2}{e^2}}+3x\right)}{d+e x}\right)^{1/3}\right.\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{3d-\sqrt{\frac{d^2}{e^2}}\,e}{3d+3ex},\frac{3d+\sqrt{\frac{d^2}{e^2}}\,e}{3d+3ex}\right]\right)\Big/\left(2e\left(d^2-9e^2x^2\right)^{1/3}\right)\right)$$

Problem 717: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+bx)\left(c+dx^2\right)^{1/4}}\,dx$$

Optimal (type 4, 278 leaves, 10 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\left(c+dx^2\right)^{1/4}}{\left(b^2c+a^2d\right)^{1/4}}\right]}{\sqrt{b}\left(b^2c+a^2d\right)^{1/4}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\left(c+dx^2\right)^{1/4}}{\left(b^2c+a^2d\right)^{1/4}}\right]}{\sqrt{b}\left(b^2c+a^2d\right)^{1/4}}-$$

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

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

Result (type 6, 126 leaves):

$$-\frac{1}{b\left(c+dx^2\right)^{1/4}}$$

$$2\left(\frac{b\left(-\sqrt{-\frac{c}{d}}+x\right)}{a+bx}\right)^{1/4}\left(\frac{b\left(\sqrt{-\frac{c}{d}}+x\right)}{a+bx}\right)^{1/4}\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},\frac{1}{4},\frac{3}{2},\frac{a-b\sqrt{-\frac{c}{d}}}{a+bx},\frac{a+b\sqrt{-\frac{c}{d}}}{a+bx}\right]$$

Problem 718: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 268 leaves, 11 steps):

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

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

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

Result (type 6, 128 leaves):

$$-\frac{1}{3 b \left(c+d x^2\right)^{3/4}} 2 \left(\frac{b \left(-\sqrt{-\frac{c}{d}}+x\right)}{a+b x}\right)^{3/4} \left(\frac{b \left(\sqrt{-\frac{c}{d}}+x\right)}{a+b x}\right)^{3/4} \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, \frac{3}{4}, \frac{5}{2}, \frac{a-b \sqrt{-\frac{c}{d}}}{a+b x}, \frac{a+b \sqrt{-\frac{c}{d}}}{a+b x}\right]$$

Problem 719: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 200 leaves, 1 step):

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

Result (type 5, 171 leaves):

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

Problem 720: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 6, 203 leaves, 15 steps):

$$x\,\text{AppellF1}\left[\frac{1}{2},1,\frac{1}{6},\frac{3}{2},x^2,-x^2\right]-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1-2^{5/6}(1+x^2)^{1/6}}{\sqrt{3}}\right]}{2\times 2^{1/6}}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1+2^{5/6}(1+x^2)^{1/6}}{\sqrt{3}}\right]}{2\times 2^{1/6}}-\frac{\text{ArcTanh}\left[\frac{(1+x^2)^{1/6}}{2^{1/6}}\right]}{2^{1/6}}+\frac{\text{Log}\left[2^{1/3}-2^{1/6}(1+x^2)^{1/6}+(1+x^2)^{1/3}\right]}{4\times 2^{1/6}}-\frac{\text{Log}\left[2^{1/3}+2^{1/6}(1+x^2)^{1/6}+(1+x^2)^{1/3}\right]}{4\times 2^{1/6}}$$

Result (type 6, 154 leaves):

$$-\left(\left((12+12\,i)\,(1+x)\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{6},\frac{1}{6},\frac{4}{3},\frac{1-i}{1+x},\frac{1+i}{1+x}\right]\right)\Big/\left((1+x^2)^{1/6}\left((4+4\,i)\,(1+x)\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{6},\frac{1}{6},\frac{4}{3},\frac{1-i}{1+x},\frac{1+i}{1+x}\right]+i\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{6},\frac{7}{6},\frac{7}{3},\frac{1-i}{1+x},\frac{1+i}{1+x}\right]+\text{AppellF1}\left[\frac{4}{3},\frac{7}{6},\frac{1}{6},\frac{7}{3},\frac{1-i}{1+x},\frac{1+i}{1+x}\right]\right)\right)\right)$$

Problem 724: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 167 leaves, 4 steps):

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

Result (type 5, 210 leaves):

$$-\frac{1}{2\sqrt{a}\,\sqrt{c}\,m}\,i\,(d+e\,x)^m\left(\left(\frac{\sqrt{c}\,(d+e\,x)}{e\left(-i\sqrt{a}+\sqrt{c}\,x\right)}\right)^{-m}\text{Hypergeometric2F1}\left[-m,-m,1-m,\frac{\sqrt{c}\,d+i\sqrt{a}\,e}{i\sqrt{a}\,e-\sqrt{c}\,e\,x}\right]-\left(\frac{\sqrt{c}\,(d+e\,x)}{e\left(i\sqrt{a}+\sqrt{c}\,x\right)}\right)^{-m}\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{\sqrt{c}\,d-i\sqrt{a}\,e}{i\sqrt{a}\,e+\sqrt{c}\,e\,x}\right]\right)$$

Problem 725: Unable to integrate problem.

$$\int \frac{(d+e x)^m}{\left(a+c x^2\right)^2} \, dx$$

Optimal (type 5, 304 leaves, 5 steps):

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

Result (type 8, 19 leaves):

$$\int \frac{(d+e x)^m}{\left(a+c x^2\right)^2} \, dx$$

Problem 726: Unable to integrate problem.

$$\int \frac{(d+e x)^m}{\left(a+c x^2\right)^3} \, dx$$

Optimal (type 5, 472 leaves, 6 steps):

$$\frac{(a e + c d x)(d + e x)^{1+m}}{4 a (c d^2 + a e^2)(a + c x^2)^2} + \left((d + e x)^{1+m} \left(a e \left(a e^2 (3 - m) + c d^2 (1 + m)\right) + c d \left(3 c d^2 + a e^2 (5 - 2 m)\right) x\right)\right) \Big/ \left(8 a^2 (c d^2 + a e^2)^2 (a + c x^2)\right) +$$

$$\left(\left(a \sqrt{c}\, d e \left(3 c d^2 + a e^2 (5 - 2 m)\right) m - \sqrt{-a}\left(3 c^2 d^4 + a c d^2 e^2 (6 - 2 m - m^2) + a^2 e^4 (3 - 4 m + m^2)\right)\right) (d + e x)^{1+m} \text{Hypergeometric2F1}\left[1, 1+m, 2+m, \frac{\sqrt{c}(d + e x)}{\sqrt{c}\, d - \sqrt{-a}\, e}\right]\right) \Big/ \left(16 a^3 \left(\sqrt{c}\, d - \sqrt{-a}\, e\right) (c d^2 + a e^2)^2 (1 + m)\right) +$$

$$\left(\left(a \sqrt{c}\, d e \left(3 c d^2 + a e^2 (5 - 2 m)\right) m + \sqrt{-a}\left(3 c^2 d^4 + a c d^2 e^2 (6 - 2 m - m^2) + a^2 e^4 (3 - 4 m + m^2)\right)\right) (d + e x)^{1+m} \text{Hypergeometric2F1}\left[1, 1+m, 2+m, \frac{\sqrt{c}(d + e x)}{\sqrt{c}\, d + \sqrt{-a}\, e}\right]\right) \Big/ \left(16 a^3 \left(\sqrt{c}\, d + \sqrt{-a}\, e\right) (c d^2 + a e^2)^2 (1 + m)\right)$$

Result (type 8, 19 leaves):

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

Problem 727: Unable to integrate problem.

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

Optimal (type 6, 154 leaves, 2 steps):

$$\left((d + e x)^{1+m} (a + c x^2)^{3/2} \text{AppellF1}\left[1+m, -\frac{3}{2}, -\frac{3}{2}, 2+m, \frac{d + e x}{d - \frac{\sqrt{-a}\, e}{\sqrt{c}}}, \frac{d + e x}{d + \frac{\sqrt{-a}\, e}{\sqrt{c}}}\right]\right) \Big/ \left(e (1 + m) \left(1 - \frac{d + e x}{d - \frac{\sqrt{-a}\, e}{\sqrt{c}}}\right)^{3/2} \left(1 - \frac{d + e x}{d + \frac{\sqrt{-a}\, e}{\sqrt{c}}}\right)^{3/2}\right)$$

Result (type 8, 21 leaves):

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

Problem 743: Attempted integration timed out after 120 seconds.

$$\int (d + e x)^{-4-2 p} (a + c x^2)^p\, dx$$

Optimal (type 5, 347 leaves, 3 steps):

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

Result (type 1, 1 leaves):

???

Problem 744: Attempted integration timed out after 120 seconds.

$$\int (d+e\,x)^{-5-2\,p}\,\left(a+c\,x^2\right)^p\,dx$$

Optimal (type 5, 436 leaves, 4 steps):

$$-\frac{c\,d\,e\,(3+p)\,(d+e\,x)^{-3-2\,p}\,\left(a+c\,x^2\right)^{1+p}}{\left(c\,d^2+a\,e^2\right)^2\,(2+p)\,(3+2\,p)}+$$
$$\frac{c\,e\,\left(a\,e^2\,(3+2\,p)-c\,d^2\,\left(9+8\,p+2\,p^2\right)\right)\,(d+e\,x)^{-2\,(1+p)}\,\left(a+c\,x^2\right)^{1+p}}{2\,\left(c\,d^2+a\,e^2\right)^3\,(1+p)\,(2+p)\,(3+2\,p)}-$$
$$\frac{e\,(d+e\,x)^{-2\,(2+p)}\,\left(a+c\,x^2\right)^{1+p}}{2\,\left(c\,d^2+a\,e^2\right)\,(2+p)}+$$
$$\left(c^2\,d\,\left(3\,a\,e^2-c\,d^2\,(3+2\,p)\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)\,\left(-\frac{\left(\sqrt{c}\,d+\sqrt{-a}\,e\right)\,\left(\sqrt{-a}+\sqrt{c}\,x\right)}{\left(\sqrt{c}\,d-\sqrt{-a}\,e\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)}\right)^{-p}\,(d+e\,x)^{-1-2\,p}\right.$$
$$\left.\left(a+c\,x^2\right)^p\,\text{Hypergeometric2F1}\left[-1-2\,p,\,-p,\,-2\,p,\,\frac{2\,\sqrt{-a}\,\sqrt{c}\,(d+e\,x)}{\left(\sqrt{c}\,d-\sqrt{-a}\,e\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)}\right]\right)\Big/$$
$$\left(\left(\sqrt{c}\,d+\sqrt{-a}\,e\right)\,\left(c\,d^2+a\,e^2\right)^3\,(1+2\,p)\,(3+2\,p)\right)$$

Result (type 1, 1 leaves):

???

Problem 745: Attempted integration timed out after 120 seconds.

$$\int (d+e\,x)^{-6-2\,p}\,\left(a+c\,x^2\right)^p\,dx$$

Optimal (type 5, 559 leaves, 5 steps):

$$-\frac{e\,(d+e\,x)^{-5-2\,p}\,\left(a+c\,x^2\right)^{1+p}}{\left(c\,d^2+a\,e^2\right)\,(5+2\,p)}+\frac{c\,e\,\left(3\,a\,e^2\,(2+p)-c\,d^2\,\left(18+11\,p+2\,p^2\right)\right)\,(d+e\,x)^{-3-2\,p}\,\left(a+c\,x^2\right)^{1+p}}{\left(c\,d^2+a\,e^2\right)^3\,(2+p)\,(3+2\,p)\,(5+2\,p)}+$$
$$\left(c^2\,d\,e\,(3+p)\,\left(a\,e^2\,(8+5\,p)-c\,d^2\,\left(8+7\,p+2\,p^2\right)\right)\,(d+e\,x)^{-2\,(1+p)}\,\left(a+c\,x^2\right)^{1+p}\right)\Big/$$
$$\left(\left(c\,d^2+a\,e^2\right)^4\,(1+p)\,(2+p)\,(3+2\,p)\,(5+2\,p)\right)-\frac{c\,d\,e\,(4+p)\,(d+e\,x)^{-2\,(2+p)}\,\left(a+c\,x^2\right)^{1+p}}{\left(c\,d^2+a\,e^2\right)^2\,(2+p)\,(5+2\,p)}-$$
$$\Bigg(c^2\,\left(3\,a^2\,e^4-6\,a\,c\,d^2\,e^2\,(5+2\,p)+c^2\,d^4\,\left(15+16\,p+4\,p^2\right)\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)$$
$$\left(-\frac{\left(\sqrt{c}\,d+\sqrt{-a}\,e\right)\,\left(\sqrt{-a}+\sqrt{c}\,x\right)}{\left(\sqrt{c}\,d-\sqrt{-a}\,e\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)}\right)^{-p}\,(d+e\,x)^{-1-2\,p}\,\left(a+c\,x^2\right)^p$$
$$\text{Hypergeometric2F1}\left[-1-2\,p,\,-p,\,-2\,p,\,\frac{2\,\sqrt{-a}\,\sqrt{c}\,(d+e\,x)}{\left(\sqrt{c}\,d-\sqrt{-a}\,e\right)\,\left(\sqrt{-a}-\sqrt{c}\,x\right)}\right]\Bigg)\Big/$$
$$\left(\left(\sqrt{c}\,d+\sqrt{-a}\,e\right)\,\left(c\,d^2+a\,e^2\right)^4\,(1+2\,p)\,(3+2\,p)\,(5+2\,p)\right)$$

Result (type 1, 1 leaves):

???

Problem 821: Result more than twice size of optimal antiderivative.

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

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

$$\sqrt{1-x^2}+\text{ArcSin}[x]$$

Result (type 3, 46 leaves):

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

Problem 823: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 16 leaves, 2 steps):

$$-\sqrt{1-x^2}+\text{ArcSin}[x]$$

Result (type 3, 54 leaves):

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

Problem 930: Result unnecessarily involves higher level functions.

$$\int \sqrt{2+e x}\,\left(12-3 e^2 x^2\right)^{1/4} \, dx$$

Optimal (type 3, 309 leaves, 14 steps):

$$\frac{3\times 3^{1/4} (2-e x)^{1/4} (2+e x)^{3/4}}{2 e}-\frac{3^{1/4} (2-e x)^{5/4} (2+e x)^{3/4}}{2 e}+\frac{3\times 3^{1/4} \text{ArcTan}\left[1-\frac{\sqrt{2} (2-e x)^{1/4}}{(2+e x)^{1/4}}\right]}{\sqrt{2} e}-\frac{3\times 3^{1/4} \text{ArcTan}\left[1+\frac{\sqrt{2} (2-e x)^{1/4}}{(2+e x)^{1/4}}\right]}{\sqrt{2} e}+\frac{3\times 3^{1/4} \text{Log}\left[\frac{\sqrt{6-3 e x}-\sqrt{6} (2-e x)^{1/4} (2+e x)^{1/4}+\sqrt{3} \sqrt{2+e x}}{\sqrt{2+e x}}\right]}{2 \sqrt{2} e}-\frac{3\times 3^{1/4} \text{Log}\left[\frac{\sqrt{6-3 e x}+\sqrt{6} (2-e x)^{1/4} (2+e x)^{1/4}+\sqrt{3} \sqrt{2+e x}}{\sqrt{2+e x}}\right]}{2 \sqrt{2} e}$$

Result (type 5, 86 leaves):

$$\frac{1}{2 e (-2+e x)}\sqrt{2+e x}\,\left(12-3 e^2 x^2\right)^{1/4} \left(-2-e x+e^2 x^2-\sqrt{2} (2-e x)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{4} (2+e x)\right]\right)$$

Problem 931: Result unnecessarily involves higher level functions.

$$\int \frac{\left(12-3 e^2 x^2\right)^{1/4}}{\sqrt{2+e x}} \, dx$$

Optimal (type 3, 269 leaves, 13 steps):

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

Result (type 5, 81 leaves):

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

Problem 932: Result unnecessarily involves higher level functions.

$$\int \frac{\left(12-3 e^2 x^2\right)^{1/4}}{(2+e x)^{3/2}} \, dx$$

Optimal (type 3, 270 leaves, 13 steps):

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

Result (type 5, 85 leaves):

$$\left(\left(4-e^2 x^2\right)^{1/4}\left(24-12 e x+\sqrt{2}\,(2-e x)^{3/4}(2+e x)\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{4}(2+e x)\right]\right)\right)\Big/\left(3^{3/4}\,e\,(-2+e x)\,\sqrt{2+e x}\right)$$

Problem 937: Result unnecessarily involves higher level functions.

$$\int\frac{(2+e x)^{5/2}}{\left(12-3 e^2 x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 340 leaves, 15 steps):

$$-\frac{5\times 3^{3/4}(2-e x)^{3/4}(2+e x)^{1/4}}{2 e}-\frac{3^{3/4}(2-e x)^{3/4}(2+e x)^{5/4}}{2 e}-\frac{(2-e x)^{3/4}(2+e x)^{9/4}}{3\times 3^{1/4}\,e}+\frac{5\times 3^{3/4}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(2-e x)^{1/4}}{(2+e x)^{1/4}}\right]}{\sqrt{2}\,e}-\frac{5\times 3^{3/4}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(2-e x)^{1/4}}{(2+e x)^{1/4}}\right]}{\sqrt{2}\,e}-\frac{5\times 3^{3/4}\,\text{Log}\left[\frac{\sqrt{6-3 e x}-\sqrt{6}\,(2-e x)^{1/4}(2+e x)^{1/4}+\sqrt{3}\,\sqrt{2+e x}}{\sqrt{2+e x}}\right]}{2\sqrt{2}\,e}+\frac{5\times 3^{3/4}\,\text{Log}\left[\frac{\sqrt{6-3 e x}+\sqrt{6}\,(2-e x)^{1/4}(2+e x)^{1/4}+\sqrt{3}\,\sqrt{2+e x}}{\sqrt{2+e x}}\right]}{2\sqrt{2}\,e}$$

Result (type 5, 88 leaves):

$$\left(\sqrt{2+e x}\left(-142+37 e x+13 e^2 x^2+2 e^3 x^3+90\sqrt{2}\,(2-e x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{4}(2+e x)\right]\right)\right)\Big/\left(6 e\left(12-3 e^2 x^2\right)^{1/4}\right)$$

Problem 938: Result unnecessarily involves higher level functions.

$$\int\frac{(2+e x)^{3/2}}{\left(12-3 e^2 x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 309 leaves, 14 steps):

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

Result (type 5, 79 leaves):

$$\left(\sqrt{2+e\,x}\,\left(-14+5\,e\,x+e^2\,x^2+10\,\sqrt{2}\,(2-e\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{4}\,(2+e\,x)\right]\right)\right)\Big/\left(2\,e\,\left(12-3\,e^2\,x^2\right)^{1/4}\right)$$

Problem 939: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{2+e\,x}}{\left(12-3\,e^2\,x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 270 leaves, 13 steps):

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

Result (type 5, 68 leaves):

$$\frac{1}{e\,\left(12-3\,e^2\,x^2\right)^{1/4}}\sqrt{2+e\,x}\,\left(-2+e\,x+2\,\sqrt{2}\,(2-e\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{4}\,(2+e\,x)\right]\right)$$

Problem 940: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{2+e\,x}\,\left(12-3\,e^2\,x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 241 leaves, 12 steps):

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

Result (type 5, 58 leaves):

$$\frac{2\,(2-e\,x)^{1/4}\,\sqrt{4+2\,e\,x}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{4},\,\frac{5}{4},\,\frac{1}{4}\,(2+e\,x)\right]}{e\,\left(12-3\,e^2\,x^2\right)^{1/4}}$$

Problem 949: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 44 leaves, 2 steps):

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

Result (type 5, 102 leaves):

$$\frac{1}{16\,a^4\,b}(a+b\,x)^m\left(4\,a\left(\frac{1}{m}+\frac{a}{(-1+m)\,(a+b\,x)}\right)+\frac{2\,(a+b\,x)\;\text{Hypergeometric2F1}\left[1,\,1+m,\,2+m,\,\frac{a+b\,x}{2\,a}\right]}{1+m}+\frac{(a+b\,x)\;\text{Hypergeometric2F1}\left[2,\,1+m,\,2+m,\,\frac{a+b\,x}{2\,a}\right]}{1+m}\right)$$

Problem 951: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d+e\,x)^m\,\left(d^2-e^2\,x^2\right)^{7/2}\,dx$$

Optimal (type 5, 59 leaves, 3 steps):

$$\frac{(d+e\,x)^m\,\left(d^2-e^2\,x^2\right)^{9/2}\;\text{Hypergeometric2F1}\left[1,\,9+m,\,\frac{11}{2}+m,\,\frac{d+e\,x}{2\,d}\right]}{d\,e\,(9+2\,m)}$$

Result (type 6, 531 leaves):

$$\frac{1}{21\,e}2\,d\,\sqrt{d-e\,x}\,\left(d+e\,x\right)^m\left(-\left(\left(84\,d^4\,e^3\,x^3\,\sqrt{d+e\,x}\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\bigg/\left(8\,d\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[4,-\frac{1}{2},\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[4,\frac{1}{2},-\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)\right)+\left(378\,d^2\,e^5\,x^5\,\sqrt{d+e\,x}\,\text{AppellF1}\left[5,-\frac{1}{2},-\frac{1}{2}-m,6,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\bigg/\left(60\,d\,\text{AppellF1}\left[5,-\frac{1}{2},-\frac{1}{2}-m,6,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+5\,e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[6,-\frac{1}{2},\frac{1}{2}-m,7,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[6,\frac{1}{2},-\frac{1}{2}-m,7,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)-\left(24\,e^7\,x^7\,\sqrt{d+e\,x}\,\text{AppellF1}\left[7,-\frac{1}{2},-\frac{1}{2}-m,8,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\bigg/\left(16\,d\,\text{AppellF1}\left[7,-\frac{1}{2},-\frac{1}{2}-m,8,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[8,-\frac{1}{2},\frac{1}{2}-m,9,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[8,\frac{1}{2},-\frac{1}{2}-m,9,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)-7\times 2^{\frac{1}{2}+m}\,d^5\,\sqrt{d-e\,x}\,\left(1+\frac{e\,x}{d}\right)^{-\frac{1}{2}-m}\sqrt{d^2-e^2\,x^2}\,\text{Hypergeometric2F1}\left[\frac{3}{2},-\frac{1}{2}-m,\frac{5}{2},\frac{d-e\,x}{2\,d}\right]\right)$$

Problem 952: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\left(d+e\,x\right)^m\left(d^2-e^2\,x^2\right)^{5/2}\,dx$$

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

$$-\frac{1}{7\,d\,e}2^{\frac{7}{2}+m}\left(d+e\,x\right)^m\left(1+\frac{e\,x}{d}\right)^{-\frac{7}{2}-m}\left(d^2-e^2\,x^2\right)^{7/2}\text{Hypergeometric2F1}\left[\frac{7}{2},-\frac{5}{2}-m,\frac{9}{2},\frac{d-e\,x}{2\,d}\right]$$

Result (type 6, 389 leaves):

$$\frac{1}{3\,e}2\,d\,\sqrt{d-e\,x}\,\left(d+e\,x\right)^m\left(-\left(\left(8\,d^2\,e^3\,x^3\,\sqrt{d+e\,x}\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\Big/\left(8\,d\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[4,-\frac{1}{2},\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[4,\frac{1}{2},-\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)\right)+\left(18\,e^5\,x^5\,\sqrt{d+e\,x}\,\text{AppellF1}\left[5,-\frac{1}{2},-\frac{1}{2}-m,6,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\Big/\left(60\,d\,\text{AppellF1}\left[5,-\frac{1}{2},-\frac{1}{2}-m,6,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+5\,e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[6,-\frac{1}{2},\frac{1}{2}-m,7,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[6,\frac{1}{2},-\frac{1}{2}-m,7,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)-2^{\frac{1}{2}+m}\,d^3\,\sqrt{d-e\,x}\,\left(1+\frac{e\,x}{d}\right)^{-\frac{1}{2}-m}\sqrt{d^2-e^2\,x^2}\,\text{Hypergeometric2F1}\left[\frac{3}{2},-\frac{1}{2}-m,\frac{5}{2},\frac{d-e\,x}{2\,d}\right]\right)$$

Problem 953: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\left(d+e\,x\right)^m\left(d^2-e^2\,x^2\right)^{3/2}\,dx$$

Optimal (type 5, 59 leaves, 3 steps):

$$\frac{\left(d+e\,x\right)^m\left(d^2-e^2\,x^2\right)^{5/2}\,\text{Hypergeometric2F1}\left[1,5+m,\frac{7}{2}+m,\frac{d+e\,x}{2\,d}\right]}{d\,e\,\left(5+2\,m\right)}$$

Result (type 6, 244 leaves):

$$\frac{1}{3\,e}2\,d\,\sqrt{d-e\,x}\,\left(d+e\,x\right)^m\left(-\left(\left(4\,e^3\,x^3\,\sqrt{d+e\,x}\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\Big/\left(8\,d\,\text{AppellF1}\left[3,-\frac{1}{2},-\frac{1}{2}-m,4,\frac{e\,x}{d},-\frac{e\,x}{d}\right]+e\,x\left(\left(1+2\,m\right)\text{AppellF1}\left[4,-\frac{1}{2},\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]-\text{AppellF1}\left[4,\frac{1}{2},-\frac{1}{2}-m,5,\frac{e\,x}{d},-\frac{e\,x}{d}\right]\right)\right)\right)-2^{\frac{1}{2}+m}\,d\,\sqrt{d-e\,x}\,\left(1+\frac{e\,x}{d}\right)^{-\frac{1}{2}-m}\sqrt{d^2-e^2\,x^2}\,\text{Hypergeometric2F1}\left[\frac{3}{2},-\frac{1}{2}-m,\frac{5}{2},\frac{d-e\,x}{2\,d}\right]\right)$$

Problem 960: Result more than twice size of optimal antiderivative.

$$\int\left(d+e\,x\right)^3\left(1-\frac{e^2\,x^2}{d^2}\right)^p\,dx$$

Optimal (type 5, 57 leaves, 2 steps):

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

Result (type 5, 240 leaves):

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

Problem 967: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 60 leaves, 2 steps):

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

Result (type 5, 271 leaves):

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

Problem 968: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 60 leaves, 2 steps):

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

Result (type 5, 150 leaves):

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

Problem 973: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 5, 85 leaves, 3 steps):

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

Result (type 6, 246 leaves):

$$\frac{1}{b}a\,(a-b\,x)^p\sqrt{a+b\,x}\left(\left(3\,b^2\,x^2\,(a+b\,x)^p\,\text{AppellF1}\left[2,-p,-\frac{1}{2}-p,3,\frac{b\,x}{a},-\frac{b\,x}{a}\right]\right)\Big/\left(6\,a\,\text{AppellF1}\left[2,-p,-\frac{1}{2}-p,3,\frac{b\,x}{a},-\frac{b\,x}{a}\right]+b\,x\left(-2\,p\,\text{AppellF1}\left[3,1-p,-\frac{1}{2}-p,4,\frac{b\,x}{a},-\frac{b\,x}{a}\right]+(1+2\,p)\;\text{AppellF1}\left[3,-p,\frac{1}{2}-p,4,\frac{b\,x}{a},-\frac{b\,x}{a}\right]\right)\right)-\frac{1}{1+p}2^{\frac{1}{2}+p}\,(a-b\,x)^{1-p}\left(1+\frac{b\,x}{a}\right)^{-\frac{1}{2}-p}\left(a^2-b^2\,x^2\right)^p\,\text{Hypergeometric2F1}\left[-\frac{1}{2}-p,1+p,2+p,\frac{a-b\,x}{2\,a}\right]\right)$$

Problem 1109: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 45 leaves, 2 steps):

$$-\frac{\left(b^2-4\,a\,c\right)\,d^4\,(b+2\,c\,x)^5}{40\,c^2}+\frac{d^4\,(b+2\,c\,x)^7}{56\,c^2}$$

Result (type 1, 102 leaves):

$$d^4\left(a\,b^4\,x+\frac{1}{2}b^3\left(b^2+8\,a\,c\right)\,x^2+b^2\,c\left(3\,b^2+8\,a\,c\right)\,x^3+8\,b\,c^2\left(b^2+a\,c\right)\,x^4+\frac{8}{5}c^3\left(7\,b^2+2\,a\,c\right)\,x^5+8\,b\,c^4\,x^6+\frac{16\,c^5\,x^7}{7}\right)$$

Problem 1121: Result more than twice size of optimal antiderivative.

$$\int (b\,d+2\,c\,d\,x)^5\,\left(a+b\,x+c\,x^2\right)^2\,dx$$

Optimal (type 1, 73 leaves, 2 steps):

$$\frac{\left(b^2-4\,a\,c\right)^2\,d^5\,(b+2\,c\,x)^6}{192\,c^3}-\frac{\left(b^2-4\,a\,c\right)\,d^5\,(b+2\,c\,x)^8}{128\,c^3}+\frac{d^5\,(b+2\,c\,x)^{10}}{320\,c^3}$$

Result (type 1, 168 leaves):

$$\frac{1}{15}\,d^5\,x\,(b+c\,x)\,\Big(5\,a^2\,\left(3\,b^4+12\,b^3\,c\,x+28\,b^2\,c^2\,x^2+32\,b\,c^3\,x^3+16\,c^4\,x^4\right)+x^2\,(b+c\,x)^2\,\left(5\,b^4+30\,b^3\,c\,x+78\,b^2\,c^2\,x^2+96\,b\,c^3\,x^3+48\,c^4\,x^4\right)+5\,a\,x\,\left(3\,b^5+19\,b^4\,c\,x+56\,b^3\,c^2\,x^2+88\,b^2\,c^3\,x^3+72\,b\,c^4\,x^4+24\,c^5\,x^5\right)\Big)$$

Problem 1122: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 73 leaves, 2 steps):

$$\frac{\left(b^2-4\,a\,c\right)^2\,d^4\,(b+2\,c\,x)^5}{160\,c^3}-\frac{\left(b^2-4\,a\,c\right)\,d^4\,(b+2\,c\,x)^7}{112\,c^3}+\frac{d^4\,(b+2\,c\,x)^9}{288\,c^3}$$

Result (type 1, 179 leaves):

$$d^4\,\Big(a^2\,b^4\,x+a\,b^3\,\left(b^2+4\,a\,c\right)\,x^2+\frac{1}{3}\,b^2\,\left(b^4+18\,a\,b^2\,c+24\,a^2\,c^2\right)\,x^3+\frac{1}{2}\,b\,c\,\left(5\,b^4+32\,a\,b^2\,c+16\,a^2\,c^2\right)\,x^4+\frac{1}{5}\,c^2\,\left(41\,b^4+112\,a\,b^2\,c+16\,a^2\,c^2\right)\,x^5+\frac{4}{3}\,b\,c^3\,\left(11\,b^2+12\,a\,c\right)\,x^6+\frac{8}{7}\,c^4\,\left(13\,b^2+4\,a\,c\right)\,x^7+8\,b\,c^5\,x^8+\frac{16\,c^6\,x^9}{9}\Big)$$

Problem 1125: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 1, 37 leaves):

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

Problem 1137: Result more than twice size of optimal antiderivative.

$$\int (b\,d + 2\,c\,d\,x)^5\,(a + b\,x + c\,x^2)^3\,dx$$

Optimal (type 1, 101 leaves, 2 steps):

$$-\frac{(b^2-4\,a\,c)^3\,d^5\,(b+2\,c\,x)^6}{768\,c^4}+\frac{3\,(b^2-4\,a\,c)^2\,d^5\,(b+2\,c\,x)^8}{1024\,c^4}-\frac{3\,(b^2-4\,a\,c)\,d^5\,(b+2\,c\,x)^{10}}{1280\,c^4}+\frac{d^5\,(b+2\,c\,x)^{12}}{1536\,c^4}$$

Result (type 1, 224 leaves):

$$\frac{1}{60}\,d^5\,x\,(b+c\,x)\,\Big(20\,a^3\,(3\,b^4+12\,b^3\,c\,x+28\,b^2\,c^2\,x^2+32\,b\,c^3\,x^3+16\,c^4\,x^4)+12\,a\,x^2\,(b+c\,x)^2\,(5\,b^4+30\,b^3\,c\,x+78\,b^2\,c^2\,x^2+96\,b\,c^3\,x^3+48\,c^4\,x^4)+x^3\,(b+c\,x)^3\,(15\,b^4+96\,b^3\,c\,x+256\,b^2\,c^2\,x^2+320\,b\,c^3\,x^3+160\,c^4\,x^4)+30\,a^2\,x\,(3\,b^5+19\,b^4\,c\,x+56\,b^3\,c^2\,x^2+88\,b^2\,c^3\,x^3+72\,b\,c^4\,x^4+24\,c^5\,x^5)\Big)$$

Problem 1138: Result more than twice size of optimal antiderivative.

$$\int (b\,d + 2\,c\,d\,x)^4\,(a + b\,x + c\,x^2)^3\,dx$$

Optimal (type 1, 101 leaves, 2 steps):

$$-\frac{(b^2-4\,a\,c)^3\,d^4\,(b+2\,c\,x)^5}{640\,c^4}+\frac{3\,(b^2-4\,a\,c)^2\,d^4\,(b+2\,c\,x)^7}{896\,c^4}-\frac{(b^2-4\,a\,c)\,d^4\,(b+2\,c\,x)^9}{384\,c^4}+\frac{d^4\,(b+2\,c\,x)^{11}}{1408\,c^4}$$

Result (type 1, 259 leaves):

$$d^4\,\Big(a^3\,b^4\,x+\frac{1}{2}\,a^2\,b^3\,(3\,b^2+8\,a\,c)\,x^2+a\,b^2\,(b^4+9\,a\,b^2\,c+8\,a^2\,c^2)\,x^3+\frac{1}{4}\,b\,(b^6+30\,a\,b^4\,c+96\,a^2\,b^2\,c^2+32\,a^3\,c^3)\,x^4+\frac{1}{5}\,c\,(11\,b^6+123\,a\,b^4\,c+168\,a^2\,b^2\,c^2+16\,a^3\,c^3)\,x^5+\frac{1}{2}\,b\,c^2\,(17\,b^4+88\,a\,b^2\,c+48\,a^2\,c^2)\,x^6+\frac{3}{7}\,c^3\,(43\,b^4+104\,a\,b^2\,c+16\,a^2\,c^2)\,x^7+24\,b\,c^4\,(b^2+a\,c)\,x^8+\frac{8}{3}\,c^5\,(7\,b^2+2\,a\,c)\,x^9+8\,b\,c^6\,x^{10}+\frac{16\,c^7\,x^{11}}{11}\Big)$$

Problem 1139: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 55 leaves, 2 steps):

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

Result (type 1, 132 leaves):

$$\frac{1}{20} d^3 x (b+c x) \left(20 a^3 \left(b^2+2 b c x+2 c^2 x^2\right)+20 a x^2 (b+c x)^2 \left(b^2+3 b c x+3 c^2 x^2\right)+x^3 (b+c x)^3 \left(5 b^2+16 b c x+16 c^2 x^2\right)+10 a^2 x \left(3 b^3+11 b^2 c x+16 b c^2 x^2+8 c^3 x^3\right)\right)$$

Problem 1141: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 1, 52 leaves):

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

Problem 1150: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x+c x^2\right)^3}{(b d+2 c d x)^9} \, dx$$

Optimal (type 1, 37 leaves, 1 step):

$$\frac{\left(a+b x+c x^2\right)^4}{4 \left(b^2-4 a c\right) d^9 (b+2 c x)^8}$$

Result (type 1, 96 leaves):

$$\left(b^6-12 a b^4 c+48 a^2 b^2 c^2-64 a^3 c^3-4 \left(b^2-4 a c\right)^2 (b+2 c x)^2+6 \left(b^2-4 a c\right) (b+2 c x)^4-4 (b+2 c x)^6\right) \Big/ \left(1024 c^4 d^9 (b+2 c x)^8\right)$$

Problem 1327: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 227 leaves, 6 steps):

$$-\frac{10\left(b^2-4 a c\right)^2 d^3 \sqrt{b d+2 c d x}\ \sqrt{a+b x+c x^2}}{231 c}-\frac{2\left(b^2-4 a c\right) d\left(b d+2 c d x\right)^{5/2} \sqrt{a+b x+c x^2}}{77 c}+\frac{\left(b d+2 c d x\right)^{9/2} \sqrt{a+b x+c x^2}}{11 c d}-\left(5\left(b^2-4 a c\right)^{13/4} d^{7/2} \sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(231 c^2 \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 223 leaves):

$$\left((d (b+2 c x))^{7/2}\left(\frac{1}{(b+2 c x)^3} c\left(a+x (b+c x)\right)\left(5 b^4+144 b^3 c x+96 b c^2 x\left(a+7 c x^2\right)+8 b^2 c\left(13 a+60 c x^2\right)+16 c^2\left(-10 a^2+6 a c x^2+21 c^2 x^4\right)\right)-\left(5 i\left(b^2-4 a c\right)^3 \sqrt{\frac{c\left(a+x (b+c x)\right)}{(b+2 c x)^2}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4 a c}}\ (b+2 c x)^{5/2}\right)\right)\right)\Big/\left(231 c^2 \sqrt{a+x (b+c x)}\right)$$

Problem 1328: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 180 leaves, 5 steps):

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

Result (type 4, 175 leaves):

$$\left((d (b+2 c x))^{3/2} \left(\frac{c (a+x (b+c x)) \left(b^2+12 b c x+4 c \left(2 a+3 c x^2\right)\right)}{b+2 c x}-\left(i \left(b^2-4 a c\right)^2 \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4 a c}} \sqrt{b+2 c x}\right)\right)\right)\Big/\left(21 c^2 \sqrt{a+x (b+c x)}\right)$$

Problem 1329: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 149 leaves):

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

Problem 1330: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 157 leaves):

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

Problem 1331: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+b\,x+c\,x^2}}{(b\,d+2\,c\,d\,x)^{9/2}}\,dx$$

Optimal (type 4, 184 leaves, 5 steps):

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

Result (type 4, 175 leaves):

$$\left(c\,(b+2\,c\,x)\,\left(a+x\,(b+c\,x)\right)\,\left(-b^2+8\,b\,c\,x+4\,c\,\left(3\,a+2\,c\,x^2\right)\right)+\frac{1}{\sqrt{-\sqrt{b^2-4\,a\,c}}}\right.$$
$$\left.i\,(b+2\,c\,x)^{11/2}\sqrt{\frac{c\,\left(a+x\,(b+c\,x)\right)}{(b+2\,c\,x)^2}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/$$
$$\left(21\,c^2\,(b^2-4\,a\,c)\,\left(d\,(b+2\,c\,x)\right)^{9/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1332: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+b\,x+c\,x^2}}{(b\,d+2\,c\,d\,x)^{13/2}}\,dx$$

Optimal (type 4, 231 leaves, 6 steps):

$$-\frac{\sqrt{a+b\,x+c\,x^2}}{11\,c\,d\,\left(b\,d+2\,c\,d\,x\right)^{11/2}}+\frac{2\,\sqrt{a+b\,x+c\,x^2}}{77\,c\,\left(b^2-4\,a\,c\right)\,d^3\,\left(b\,d+2\,c\,d\,x\right)^{7/2}}+$$

$$\frac{10\,\sqrt{a+b\,x+c\,x^2}}{231\,c\,\left(b^2-4\,a\,c\right)^2\,d^5\,\left(b\,d+2\,c\,d\,x\right)^{3/2}}+\frac{5\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],\,-1\right]}{231\,c^2\,\left(b^2-4\,a\,c\right)^{7/4}\,d^{13/2}\,\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 193 leaves):

$$\left(-c\,\left(b+2\,c\,x\right)\,\left(a+x\,\left(b+c\,x\right)\right)\right.$$
$$\left(21\,\left(b^2-4\,a\,c\right)^2-6\,\left(b^2-4\,a\,c\right)\,\left(b+2\,c\,x\right)^2-10\,\left(b+2\,c\,x\right)^4\right)+\frac{1}{\sqrt{-\sqrt{b^2-4\,a\,c}}}$$
$$\left.5\,\mathrm{i}\,\left(b+2\,c\,x\right)^{15/2}\,\sqrt{\frac{c\,\left(a+x\,\left(b+c\,x\right)\right)}{\left(b+2\,c\,x\right)^2}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],\,-1\right]\right)\Big/$$
$$\left(231\,c^2\,\left(b^2-4\,a\,c\right)^2\,\left(d\,\left(b+2\,c\,x\right)\right)^{13/2}\,\sqrt{a+x\,\left(b+c\,x\right)}\right)$$

Problem 1333: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(b\,d+2\,c\,d\,x\right)^{5/2}\,\sqrt{a+b\,x+c\,x^2}\,\,dx$$

Optimal (type 4, 279 leaves, 8 steps):

$$-\frac{2\,\left(b^2-4\,a\,c\right)\,d\,\left(b\,d+2\,c\,d\,x\right)^{3/2}\,\sqrt{a+b\,x+c\,x^2}}{45\,c}+\frac{\left(b\,d+2\,c\,d\,x\right)^{7/2}\,\sqrt{a+b\,x+c\,x^2}}{9\,c\,d}-$$
$$\left(\left(b^2-4\,a\,c\right)^{11/4}\,d^{5/2}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],\,-1\right]\right)\Big/$$
$$\left(15\,c^2\,\sqrt{a+b\,x+c\,x^2}\right)+$$
$$\left(\left(b^2-4\,a\,c\right)^{11/4}\,d^{5/2}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],\,-1\right]\right)\Big/$$
$$\left(15\,c^2\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 208 leaves):

$$\left((d\,(b+2\,c\,x))^{5/2}\left(\frac{c\,(a+x\,(b+c\,x))\,\left(3\,b^2+20\,b\,c\,x+4\,c\,\left(2\,a+5\,c\,x^2\right)\right)}{b+2\,c\,x}+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{5/2}}\right.\right.$$
$$3\,\mathrm{i}\,\left(b^2-4\,a\,c\right)^{3/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\right.$$
$$\left.\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(45\,c^2\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1334: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}\,dx$$

Optimal (type 4, 236 leaves, 7 steps):

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

Result (type 4, 246 leaves):

$$-\left(\left(d\sqrt{-\frac{b+2cx}{\sqrt{b^2-4ac}}}\left(-\frac{c\,(b+2cx)^2\,(a+x\,(b+cx))}{\sqrt{-\frac{b+2cx}{\sqrt{b^2-4ac}}}}+\right.\right.\right.$$

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

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

$$\left.\left(5\,c^2\sqrt{d\,(b+2cx)}\;\sqrt{a+x\,(b+cx)}\right)\right)$$

Problem 1335: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 229 leaves, 7 steps):

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

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

Result (type 4, 176 leaves):

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

Problem 1336: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 283 leaves, 8 steps):

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

Result (type 4, 208 leaves):

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

Problem 1337: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 274 leaves, 7 steps):

$$\frac{\left(b^2-4\,a\,c\right)^3\,d^3\,\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}}{231\,c^2}+\frac{\left(b^2-4\,a\,c\right)^2\,d\,(b\,d+2\,c\,d\,x)^{5/2}\,\sqrt{a+b\,x+c\,x^2}}{385\,c^2}-\frac{\left(b^2-4\,a\,c\right)\,(b\,d+2\,c\,d\,x)^{9/2}\,\sqrt{a+b\,x+c\,x^2}}{110\,c^2\,d}+\frac{(b\,d+2\,c\,d\,x)^{9/2}\,\left(a+b\,x+c\,x^2\right)^{3/2}}{15\,c\,d}+\left(\left(b^2-4\,a\,c\right)^{17/4}\,d^{7/2}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],-1\right]\right)\Big/\left(462\,c^3\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 295 leaves):

$$\left((d\,(b+2\,c\,x))^{7/2}\left(\frac{1}{(b+2\,c\,x)^3}c\,(a+x\,(b+c\,x))\,\left(-5\,b^6+10\,b^5\,c\,x+16\,b^3\,c^2\,x\,\left(107\,a+266\,c\,x^2\right)+2\,b^4\,c\,\left(35\,a+453\,c\,x^2\right)+32\,b\,c^3\,x\,\left(12\,a^2+238\,a\,c\,x^2+231\,c^2\,x^4\right)+16\,b^2\,c^2\,\left(36\,a^2+345\,a\,c\,x^2+518\,c^2\,x^4\right)+32\,c^3\,\left(-20\,a^3+12\,a^2\,c\,x^2+119\,a\,c^2\,x^4+77\,c^3\,x^6\right)\right)+\left(5\,i\,\left(b^2-4\,a\,c\right)^4\,\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4\,a\,c}}\,(b+2\,c\,x)^{5/2}\right)\right)\right)\Big/\left(2310\,c^3\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1338: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 227 leaves, 6 steps):

$$\frac{\left(b^2-4 a c\right)^2 d \sqrt{b d+2 c d x} \sqrt{a+b x+c x^2}}{77 c^2}-\frac{3 \left(b^2-4 a c\right) (b d+2 c d x)^{5/2} \sqrt{a+b x+c x^2}}{154 c^2 d}+\frac{(b d+2 c d x)^{5/2} \left(a+b x+c x^2\right)^{3/2}}{11 c d}+\left(\left(b^2-4 a c\right)^{13/4} d^{3/2} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(154 c^3 \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 225 leaves):

$$\left((d (b+2 c x))^{3/2} \left(\frac{1}{b+2 c x} c (a+x (b+c x)) \left(-b^4+2 b^3 c x+8 b c^2 x \left(13 a+14 c x^2\right)+2 b^2 c \left(5 a+29 c x^2\right)+8 c^2 \left(4 a^2+13 a c x^2+7 c^2 x^4\right)\right)+\left(i \left(b^2-4 a c\right)^3 \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4 a c}} \sqrt{b+2 c x}\right)\right)\right)\Big/\left(154 c^3 \sqrt{a+x (b+c x)}\right)$$

Problem 1339: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 182 leaves, 5 steps):

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

Result (type 4, 174 leaves):

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

Problem 1340: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 174 leaves, 5 steps):

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

Result (type 4, 170 leaves):

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

Problem 1341: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x+c x^2\right)^{3/2}}{(b d+2 c d x)^{9/2}}\, dx$$

Optimal (type 4, 174 leaves, 5 steps):

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

Result (type 4, 159 leaves):

$$\left(c\,(b+2\,c\,x)\,(a+x\,(b+c\,x))\,\left(b^2-4\,a\,c-3\,(b+2\,c\,x)^2\right)+\frac{1}{\sqrt{-\sqrt{b^2-4\,a\,c}}}\right.$$
$$\left.2\,\mathrm{i}\,(b+2\,c\,x)^{11/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/$$
$$\left(28\,c^3\,(d\,(b+2\,c\,x))^{9/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1342: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{(b\,d+2\,c\,d\,x)^{13/2}}\,dx$$

Optimal (type 4, 221 leaves, 6 steps):

$$-\frac{3\sqrt{a+b\,x+c\,x^2}}{154\,c^2\,d^3\,(b\,d+2\,c\,d\,x)^{7/2}}+\frac{\sqrt{a+b\,x+c\,x^2}}{77\,c^2\,\left(b^2-4\,a\,c\right)\,d^5\,(b\,d+2\,c\,d\,x)^{3/2}}-$$
$$\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{11\,c\,d\,(b\,d+2\,c\,d\,x)^{11/2}}+\frac{\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]}{154\,c^3\,\left(b^2-4\,a\,c\right)^{3/4}\,d^{13/2}\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 192 leaves):

$$\left(c\,(b+2\,c\,x)\,(a+x\,(b+c\,x))\right.$$
$$\left(7\left(b^2-4\,a\,c\right)^2-13\left(b^2-4\,a\,c\right)(b+2\,c\,x)^2+4\,(b+2\,c\,x)^4\right)+\frac{1}{\sqrt{-\sqrt{b^2-4\,a\,c}}}$$
$$\left.2\,\mathrm{i}\,(b+2\,c\,x)^{15/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/$$
$$\left(308\,c^3\left(b^2-4\,a\,c\right)(d\,(b+2\,c\,x))^{13/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1343: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{(b\,d+2\,c\,d\,x)^{17/2}}\,dx$$

Optimal (type 4, 268 leaves, 7 steps):

$$-\frac{\sqrt{a+b x+c x^2}}{110 c^2 d^3 (b d+2 c d x)^{11/2}}+\frac{\sqrt{a+b x+c x^2}}{385 c^2 (b^2-4 a c) d^5 (b d+2 c d x)^{7/2}}+\frac{\sqrt{a+b x+c x^2}}{231 c^2 (b^2-4 a c)^2 d^7 (b d+2 c d x)^{3/2}}-\frac{(a+b x+c x^2)^{3/2}}{15 c d (b d+2 c d x)^{15/2}}+\frac{\sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]}{462 c^3 (b^2-4 a c)^{7/4} d^{17/2} \sqrt{a+b x+c x^2}}$$

Result (type 4, 212 leaves):

$$\left(c (b+2 c x) (a+x (b+c x)) \left(77 (b^2-4 a c)^3-119 (b^2-4 a c)^2 (b+2 c x)^2+12 (b^2-4 a c) (b+2 c x)^4+20 (b+2 c x)^6\right)+\frac{1}{\sqrt{-\sqrt{b^2-4 a c}}} 10\, i\, (b+2 c x)^{19/2} \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(4620 c^3 (b^2-4 a c)^2 (d (b+2 c x))^{17/2} \sqrt{a+x (b+c x)}\right)$$

Problem 1344: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 326 leaves, 9 steps):

$$\frac{(b^2-4 a c)^2 d (b d+2 c d x)^{3/2} \sqrt{a+b x+c x^2}}{195 c^2}-\frac{(b^2-4 a c) (b d+2 c d x)^{7/2} \sqrt{a+b x+c x^2}}{78 c^2 d}+\frac{(b d+2 c d x)^{7/2} (a+b x+c x^2)^{3/2}}{13 c d}+\left((b^2-4 a c)^{15/4} d^{5/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(130 c^3 \sqrt{a+b x+c x^2}\right)-\left((b^2-4 a c)^{15/4} d^{5/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(130 c^3 \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 256 leaves) :

$$\left((d (b+2 c x))^{5/2} \left(\frac{1}{b+2 c x} c (a+x (b+c x)) \left(-3 b^4+10 b^3 c x+40 b c^2 x \left(5 a+6 c x^2\right)+2 b^2 c \left(17 a+65 c x^2\right)+8 c^2 \left(4 a^2+25 a c x^2+15 c^2 x^4\right)\right)-\frac{1}{\left(-\frac{b+2 c x}{\sqrt{b^2-4 a c}}\right)^{5/2}} 3 \, i \left(b^2-4 a c\right)^{5/2} \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \left(\text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]-\text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right)\right) \Big/ \left(390 c^3 \sqrt{a+x (b+c x)}\right)$$

Problem 1345: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 281 leaves, 8 steps) :

$$-\frac{\left(b^2-4 a c\right) (b d+2 c d x)^{3/2} \sqrt{a+b x+c x^2}}{30 c^2 d}+\frac{(b d+2 c d x)^{3/2} \left(a+b x+c x^2\right)^{3/2}}{9 c d}+\left(\left(b^2-4 a c\right)^{11/4} \sqrt{d} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right) \Big/ \left(30 c^3 \sqrt{a+b x+c x^2}\right)-\left(\left(b^2-4 a c\right)^{11/4} \sqrt{d} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right) \Big/ \left(30 c^3 \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 206 leaves) :

$$\left(\sqrt{d\,(b+2\,c\,x)}\left(c\,(b+2\,c\,x)\,\left(a+x\,(b+c\,x)\right)\,\left(-3\,b^2+10\,b\,c\,x+2\,c\,\left(11\,a+5\,c\,x^2\right)\right)-\frac{1}{\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}\right.\right.$$

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

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(90\,c^3\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1346: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 271 leaves, 8 steps):

$$\frac{3\,(b\,d+2\,c\,d\,x)^{3/2}\sqrt{a+b\,x+c\,x^2}}{10\,c^2\,d^3}-\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{c\,d\,\sqrt{b\,d+2\,c\,d\,x}}-$$

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

$$\left(10\,c^3\,d^{3/2}\sqrt{a+b\,x+c\,x^2}\right)+$$

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

$$\left(10\,c^3\,d^{3/2}\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 200 leaves):

$$\left(c\,(a+x\,(b+c\,x))\,\left(3\,b^2+2\,b\,c\,x+2\,c\,\left(-5\,a+c\,x^2\right)\right)-3\,i\,\left(b^2-4\,a\,c\right)^2\right.$$

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

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

Problem 1347: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 273 leaves, 8 steps):

$$-\frac{3\,\sqrt{a+b\,x+c\,x^2}}{10\,c^2\,d^3\,\sqrt{b\,d+2\,c\,d\,x}}-\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{5\,c\,d\,(b\,d+2\,c\,d\,x)^{5/2}}+$$

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

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

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

$$\left(10\,c^3\,d^{7/2}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 198 leaves):

$$\left(-c\,(a+x\,(b+c\,x))\,\left(3\,b^2+14\,b\,c\,x+2\,c\,\left(a+7\,c\,x^2\right)\right)+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/2}}\right.$$

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

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

Problem 1348: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x+c x^2\right)^{3/2}}{(b d+2 c d x)^{11/2}} \, dx$$

Optimal (type 4, 320 leaves, 9 steps):

$$-\frac{\sqrt{a+b x+c x^2}}{30 c^2 d^3 (b d+2 c d x)^{5/2}}+\frac{\sqrt{a+b x+c x^2}}{15 c^2 \left(b^2-4 a c\right) d^5 \sqrt{b d+2 c d x}}-\frac{\left(a+b x+c x^2\right)^{3/2}}{9 c d (b d+2 c d x)^{9/2}}-\frac{\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{30 c^3 \left(b^2-4 a c\right)^{1/4} d^{11/2} \sqrt{a+b x+c x^2}}+\frac{\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{30 c^3 \left(b^2-4 a c\right)^{1/4} d^{11/2} \sqrt{a+b x+c x^2}}$$

Result (type 4, 229 leaves):

$$\left(\frac{1}{b^2-4 a c} c (b+2 c x) (a+x (b+c x)) \left(5 \left(b^2-4 a c\right)^2-11 \left(b^2-4 a c\right) (b+2 c x)^2+12 (b+2 c x)^4\right)-6 i (b+2 c x)^5 \sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}} \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \left(\text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]-\text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right) \Big/ \left(180 c^3 (d (b+2 c x))^{11/2} \sqrt{a+x (b+c x)}\right)$$

Problem 1349: Result unnecessarily involves imaginary or complex numbers.

$$\int (b d+2 c d x)^{7/2} \left(a+b x+c x^2\right)^{5/2} \, dx$$

Optimal (type 4, 321 leaves, 8 steps):

$$-\frac{5\left(b^2-4ac\right)^4 d^3\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}}{8778\,c^3}-\frac{\left(b^2-4ac\right)^3 d\left(b\,d+2\,c\,d\,x\right)^{5/2}\sqrt{a+b\,x+c\,x^2}}{2926\,c^3}+\frac{\left(b^2-4ac\right)^2\left(b\,d+2\,c\,d\,x\right)^{9/2}\sqrt{a+b\,x+c\,x^2}}{836\,c^3\,d}-\frac{\left(b^2-4ac\right)\left(b\,d+2\,c\,d\,x\right)^{9/2}\left(a+b\,x+c\,x^2\right)^{3/2}}{114\,c^2\,d}+\frac{\left(b\,d+2\,c\,d\,x\right)^{9/2}\left(a+b\,x+c\,x^2\right)^{5/2}}{19\,c\,d}-\left(5\left(b^2-4ac\right)^{21/4} d^{7/2}\sqrt{-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(17556\,c^4\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 386 leaves):

$$\frac{1}{17556\,c^4\sqrt{a+x\left(b+c\,x\right)}}\left(d\left(b+2\,c\,x\right)\right)^{7/2}\left(\frac{1}{\left(b+2\,c\,x\right)^3}c\left(a+x\left(b+c\,x\right)\right)\left(5\,b^8-10\,b^7\,c\,x+18\,b^6\,c\left(-5\,a+c\,x^2\right)+8\,b^5\,c^2\,x\left(22\,a+623\,c\,x^2\right)+32\,b^3\,c^3\,x\left(433\,a^2+2142\,a\,c\,x^2+2310\,c^2\,x^4\right)+4\,b^4\,c^2\left(157\,a^2+3684\,a\,c\,x^2+7399\,c^2\,x^4\right)+128\,b\,c^4\,x\left(12\,a^3+469\,a^2\,c\,x^2+924\,a\,c^2\,x^4+462\,c^3\,x^6\right)+32\,b^2\,c^3\left(92\,a^3+1371\,a^2\,c\,x^2+4151\,a\,c^2\,x^4+2926\,c^3\,x^6\right)+64\,c^4\left(-40\,a^4+24\,a^3\,c\,x^2+469\,a^2\,c^2\,x^4+616\,a\,c^3\,x^6+231\,c^4\,x^8\right)\right)-\left(5\,i\left(b^2-4\,a\,c\right)^5\sqrt{\frac{c\left(a+x\left(b+c\,x\right)\right)}{\left(b+2\,c\,x\right)^2}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4\,a\,c}}\left(b+2\,c\,x\right)^{5/2}\right)\right)$$

Problem 1350: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 274 leaves, 7 steps):

$$-\frac{\left(b^2-4ac\right)^3 d\sqrt{bd+2cdx}\,\sqrt{a+bx+cx^2}}{462c^3}+\frac{\left(b^2-4ac\right)^2\left(bd+2cdx\right)^{5/2}\sqrt{a+bx+cx^2}}{308c^3 d}-\frac{\left(b^2-4ac\right)\left(bd+2cdx\right)^{5/2}\left(a+bx+cx^2\right)^{3/2}}{66c^2 d}+\frac{\left(bd+2cdx\right)^{5/2}\left(a+bx+cx^2\right)^{5/2}}{15cd}-\left(\left(b^2-4ac\right)^{17/4} d^{3/2}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{bd+2cdx}}{\left(b^2-4ac\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(924c^4\sqrt{a+bx+cx^2}\right)$$

Result (type 4, 295 leaves):

$$\left(\left(d\left(b+2cx\right)\right)^{3/2}\left(\frac{1}{b+2cx}c\left(a+x\left(b+cx\right)\right)\left(5b^6-10b^5cx+2b^4c\left(-35a+9cx^2\right)+8b^3c^2x\left(17a+161cx^2\right)+16bc^3x\left(207a^2+448acx^2+231c^2x^4\right)+4b^2c^2\left(87a^2+930acx^2+931c^2x^4\right)+16c^3\left(40a^3+207a^2cx^2+224ac^2x^4+77c^3x^6\right)\right)-\left(5\,\mathrm{i}\left(b^2-4ac\right)^4\sqrt{\frac{c\left(a+x\left(b+cx\right)\right)}{\left(b+2cx\right)^2}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4ac}}}{\sqrt{b+2cx}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4ac}}\,\sqrt{b+2cx}\right)\right)\right)\Big/\left(4620c^4\sqrt{a+x\left(b+cx\right)}\right)$$

Problem 1351: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+bx+cx^2\right)^{5/2}}{\sqrt{bd+2cdx}}\,dx$$

Optimal (type 4, 229 leaves, 6 steps):

$$\frac{5\left(b^2-4ac\right)^2\sqrt{bd+2cdx}\,\sqrt{a+bx+cx^2}}{308c^3 d}-\frac{5\left(b^2-4ac\right)\sqrt{bd+2cdx}\left(a+bx+cx^2\right)^{3/2}}{154c^2 d}+\frac{\sqrt{bd+2cdx}\left(a+bx+cx^2\right)^{5/2}}{11cd}-\left(5\left(b^2-4ac\right)^{13/4}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{bd+2cdx}}{\left(b^2-4ac\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(308c^4\sqrt{d}\,\sqrt{a+bx+cx^2}\right)$$

Result (type 4, 223 leaves):

$$\Bigg(c\,(b+2\,c\,x)\,(a+x\,(b+c\,x))\,\left(5\,b^4-10\,b^3\,c\,x+8\,b\,c^2\,x\,(12\,a+7\,c\,x^2)+2\,b^2\,c\,(-25\,a+9\,c\,x^2)+4\,c^2\,(37\,a^2+24\,a\,c\,x^2+7\,c^2\,x^4)\right)-\frac{1}{\sqrt{-\sqrt{b^2-4\,a\,c}}}5\,i\,(b^2-4\,a\,c)^3\,(b+2\,c\,x)^{3/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\Bigg)\Big/\left(308\,c^4\,\sqrt{d\,(b+2\,c\,x)}\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1352: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 219 leaves, 6 steps):

$$-\frac{5\,(b^2-4\,a\,c)\,\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}}{84\,c^3\,d^3}+\frac{5\,\sqrt{b\,d+2\,c\,d\,x}\,(a+b\,x+c\,x^2)^{3/2}}{42\,c^2\,d^3}-\frac{(a+b\,x+c\,x^2)^{5/2}}{3\,c\,d\,(b\,d+2\,c\,d\,x)^{3/2}}+\left(5\,(b^2-4\,a\,c)^{9/4}\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(84\,c^4\,d^{5/2}\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 201 leaves):

$$\Bigg(\frac{1}{4\,c^3}(b+2\,c\,x)^3\,(a+x\,(b+c\,x))\left(-13\,b^2+64\,a\,c+12\,b\,c\,x+12\,c^2\,x^2-\frac{7\,(b^2-4\,a\,c)^2}{(b+2\,c\,x)^2}\right)+\left(5\,i\,(b^2-4\,a\,c)^2\,(b+2\,c\,x)^{7/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/\left(c^4\sqrt{-\sqrt{b^2-4\,a\,c}}\right)\Bigg)\Big/\left(84\,(d\,(b+2\,c\,x))^{5/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1353: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,x+c\,x^2)^{5/2}}{(b\,d+2\,c\,d\,x)^{9/2}}\,dx$$

Optimal (type 4, 211 leaves, 6 steps):

$$\frac{5\sqrt{b d+2 c d x}\,\sqrt{a+b x+c x^2}}{84 c^3 d^5}-\frac{5\left(a+b x+c x^2\right)^{3/2}}{42 c^2 d^3 (b d+2 c d x)^{3/2}}-\frac{\left(a+b x+c x^2\right)^{5/2}}{7 c d (b d+2 c d x)^{7/2}}-\left(5\left(b^2-4 a c\right)^{5/4}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(84 c^4 d^{9/2}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 195 leaves):

$$\left(-\frac{1}{4 c^3}(b+2 c x)\,(a+x (b+c x))\left(3\left(b^2-4 a c\right)^2-16\left(b^2-4 a c\right)(b+2 c x)^2-7 (b+2 c x)^4\right)-\left(5 i\left(b^2-4 a c\right)(b+2 c x)^{11/2}\sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(c^4\sqrt{-\sqrt{b^2-4 a c}}\right)\right)\Big/\left(84 (d (b+2 c x))^{9/2}\sqrt{a+x (b+c x)}\right)$$

Problem 1354: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b x+c x^2\right)^{5/2}}{(b d+2 c d x)^{13/2}}\,dx$$

Optimal (type 4, 211 leaves, 6 steps):

$$-\frac{5\sqrt{a+b x+c x^2}}{308 c^3 d^5 (b d+2 c d x)^{3/2}}-\frac{5\left(a+b x+c x^2\right)^{3/2}}{154 c^2 d^3 (b d+2 c d x)^{7/2}}-\frac{\left(a+b x+c x^2\right)^{5/2}}{11 c d (b d+2 c d x)^{11/2}}+\left(5\left(b^2-4 a c\right)^{1/4}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(308 c^4 d^{13/2}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 187 leaves):

$$\left(-\frac{1}{4c^3}(b+2cx)\,(a+x(b+cx))\left(7\left(b^2-4ac\right)^2-24\left(b^2-4ac\right)(b+2cx)^2+37(b+2cx)^4\right)+\left(5\,i\,(b+2cx)^{15/2}\sqrt{\frac{c\,(a+x(b+cx))}{(b+2cx)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4ac}}}{\sqrt{b+2cx}}\right],-1\right]\right)\Big/\left(c^4\sqrt{-\sqrt{b^2-4ac}}\right)\right)\Big/\left(308\,(d\,(b+2cx))^{13/2}\sqrt{a+x(b+cx)}\right)$$

Problem 1355: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+bx+cx^2\right)^{5/2}}{(bd+2cdx)^{17/2}}\,dx$$

Optimal (type 4, 258 leaves, 7 steps):

$$-\frac{\sqrt{a+bx+cx^2}}{308c^3d^5(bd+2cdx)^{7/2}}+\frac{\sqrt{a+bx+cx^2}}{462c^3\left(b^2-4ac\right)d^7(bd+2cdx)^{3/2}}-\frac{\left(a+bx+cx^2\right)^{3/2}}{66c^2d^3(bd+2cdx)^{11/2}}-\frac{\left(a+bx+cx^2\right)^{5/2}}{15cd(bd+2cdx)^{15/2}}+\frac{\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{bd+2cdx}}{\left(b^2-4ac\right)^{1/4}\sqrt{d}}\right],-1\right]}{924c^4\left(b^2-4ac\right)^{3/4}d^{17/2}\sqrt{a+bx+cx^2}}$$

Result (type 4, 213 leaves):

$$\left(-c\,(b+2cx)\,(a+x(b+cx))\left(77\left(b^2-4ac\right)^3-224\left(b^2-4ac\right)^2(b+2cx)^2+207\left(b^2-4ac\right)(b+2cx)^4-40(b+2cx)^6\right)+\frac{1}{\sqrt{-\sqrt{b^2-4ac}}}20\,i\,(b+2cx)^{19/2}\sqrt{\frac{c\,(a+x(b+cx))}{(b+2cx)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4ac}}}{\sqrt{b+2cx}}\right],-1\right]\right)\Big/\left(18480\,c^4\left(b^2-4ac\right)(d\,(b+2cx))^{17/2}\sqrt{a+x(b+cx)}\right)$$

Problem 1356: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+bx+cx^2\right)^{5/2}}{(bd+2cdx)^{21/2}}\,dx$$

Optimal (type 4, 305 leaves, 8 steps):

$$-\frac{\sqrt{a+b x+c x^2}}{836 c^3 d^5 (b d+2 c d x)^{11/2}}+\frac{\sqrt{a+b x+c x^2}}{2926 c^3 (b^2-4 a c) d^7 (b d+2 c d x)^{7/2}}+\frac{5 \sqrt{a+b x+c x^2}}{8778 c^3 (b^2-4 a c)^2 d^9 (b d+2 c d x)^{3/2}}-\frac{(a+b x+c x^2)^{3/2}}{114 c^2 d^3 (b d+2 c d x)^{15/2}}-\frac{(a+b x+c x^2)^{5/2}}{19 c d (b d+2 c d x)^{19/2}}+\frac{5 \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]}{17556 c^4 (b^2-4 a c)^{7/4} d^{21/2} \sqrt{a+b x+c x^2}}$$

Result (type 4, 233 leaves):

$$\left(-c (b+2 c x) (a+x (b+c x)) \left(231 (b^2-4 a c)^4-616 (b^2-4 a c)^3 (b+2 c x)^2+469 (b^2-4 a c)^2 (b+2 c x)^4-24 (b^2-4 a c) (b+2 c x)^6-40 (b+2 c x)^8\right)+\frac{1}{\sqrt{-\sqrt{b^2-4 a c}}} 20 i (b+2 c x)^{23/2} \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right) \Big/ \left(70224 c^4 (b^2-4 a c)^2 (d (b+2 c x))^{21/2} \sqrt{a+x (b+c x)}\right)$$

Problem 1357: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 373 leaves, 10 steps):

$$-\frac{(b^2-4 a c)^3 d (b d+2 c d x)^{3/2} \sqrt{a+b x+c x^2}}{1326 c^3}+\frac{5 (b^2-4 a c)^2 (b d+2 c d x)^{7/2} \sqrt{a+b x+c x^2}}{2652 c^3 d}-\frac{5 (b^2-4 a c) (b d+2 c d x)^{7/2} (a+b x+c x^2)^{3/2}}{442 c^2 d}+\frac{(b d+2 c d x)^{7/2} (a+b x+c x^2)^{5/2}}{17 c d}-\left((b^2-4 a c)^{19/4} d^{5/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]\right) \Big/ \left(884 c^4 \sqrt{a+b x+c x^2}\right)+\left((b^2-4 a c)^{19/4} d^{5/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]\right) \Big/ \left(884 c^4 \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 327 leaves):

$$\left((d\,(b+2\,c\,x))^{5/2}\left(\frac{1}{b+2\,c\,x}c\,(a+x\,(b+c\,x))\,\left(3\,b^6-10\,b^5\,c\,x+8\,b^3\,c^2\,x\,\left(19\,a+87\,c\,x^2\right)+b^4\,\left(-46\,a\,c+26\,c^2\,x^2\right)+16\,b\,c^3\,x\,\left(89\,a^2+216\,a\,c\,x^2+117\,c^2\,x^4\right)+4\,b^2\,c^2\,\left(65\,a^2+470\,a\,c\,x^2+477\,c^2\,x^4\right)+16\,c^3\,\left(8\,a^3+89\,a^2\,c\,x^2+108\,a\,c^2\,x^4+39\,c^3\,x^6\right)\right)+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{5/2}}3\,i\,\left(b^2-4\,a\,c\right)^{7/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(2652\,c^4\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1358: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{b\,d+2\,c\,d\,x}\,\left(a+b\,x+c\,x^2\right)^{5/2}\,dx$$

Optimal (type 4, 328 leaves, 9 steps):

$$\frac{\left(b^2-4\,a\,c\right)^2\,(b\,d+2\,c\,d\,x)^{3/2}\,\sqrt{a+b\,x+c\,x^2}}{156\,c^3\,d}-\frac{5\,\left(b^2-4\,a\,c\right)\,(b\,d+2\,c\,d\,x)^{3/2}\,\left(a+b\,x+c\,x^2\right)^{3/2}}{234\,c^2\,d}+\frac{(b\,d+2\,c\,d\,x)^{3/2}\,\left(a+b\,x+c\,x^2\right)^{5/2}}{13\,c\,d}-\left(\left(b^2-4\,a\,c\right)^{15/4}\sqrt{d}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(156\,c^4\,\sqrt{a+b\,x+c\,x^2}\right)+\left(\left(b^2-4\,a\,c\right)^{15/4}\sqrt{d}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/\left(156\,c^4\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 255 leaves):

$$\left(\sqrt{d\left(b+2\,c\,x\right)}\left(c\left(b+2\,c\,x\right)\left(a+x\left(b+c\,x\right)\right)\left(3\,b^4-10\,b^3\,c\,x+8\,b\,c^2\,x\left(14\,a+9\,c\,x^2\right)+b^2\left(-34\,a\,c+26\,c^2\,x^2\right)+4\,c^2\left(31\,a^2+28\,a\,c\,x^2+9\,c^2\,x^4\right)\right)+\frac{1}{\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}3\,\mathrm{i}\left(b^2-4\,a\,c\right)^{7/2}\sqrt{\frac{c\left(a+x\left(b+c\,x\right)\right)}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(468\,c^4\sqrt{a+x\left(b+c\,x\right)}\right)$$

Problem 1359: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 316 leaves, 9 steps):

$$-\frac{\left(b^2-4 a c\right) (b d+2 c d x)^{3/2} \sqrt{a+b x+c x^2}}{12 c^3 d^3}+\frac{5 (b d+2 c d x)^{3/2} \left(a+b x+c x^2\right)^{3/2}}{18 c^2 d^3}-\frac{\left(a+b x+c x^2\right)^{5/2}}{c d \sqrt{b d+2 c d x}}+\left(\left(b^2-4 a c\right)^{11/4} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(12 c^4 d^{3/2} \sqrt{a+b x+c x^2}\right)-\left(\left(b^2-4 a c\right)^{11/4} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]\right)\Big/\left(12 c^4 d^{3/2} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 246 leaves):

$$\left(c (a+x (b+c x)) \left(-3 b^4-2 b^3 c x+8 b c^2 x \left(2 a+c x^2\right)+2 b^2 c \left(11 a+c x^2\right)+4 c^2 \left(-9 a^2+4 a c x^2+c^2 x^4\right)\right)+3 i \left(b^2-4 a c\right)^3 \sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}} \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right)\Big/\left(36 c^4 d \sqrt{d (b+2 c x)} \sqrt{a+x (b+c x)}\right)$$

Problem 1360: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x+c x^2\right)^{5/2}}{(b d+2 c d x)^{7/2}} \, dx$$

Optimal (type 4, 310 leaves, 9 steps):

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

Result (type 4, 253 leaves):

$$\left(c\left(a+x\left(b+c x\right)\right)\right.$$
$$\left(3 b^4+14 b^3 c x+8 b c^2 x\left(-6 a+c x^2\right)+2 b^2 c\left(-5 a+9 c x^2\right)+4 c^2\left(-a^2-12 a c x^2+c^2 x^4\right)\right)-$$
$$\frac{1}{\left(-\frac{b+2 c x}{\sqrt{b^2-4 a c}}\right)^{3/2}}3\,i\left(b^2-4 a c\right)\left(b+2 c x\right)^4\sqrt{\frac{c\left(a+x\left(b+c x\right)\right)}{-b^2+4 a c}}$$
$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]-\right.$$
$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right)\Big/\left(20 c^4 d\left(d\left(b+2 c x\right)\right)^{5/2}\sqrt{a+x\left(b+c x\right)}\right)$$

Problem 1361: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b x+c x^2\right)^{5/2}}{\left(b d+2 c d x\right)^{11/2}}\,dx$$

Optimal (type 4, 310 leaves, 9 steps):

$$-\frac{\sqrt{a+b x+c x^2}}{12 c^3 d^5 \sqrt{b d+2 c d x}}-\frac{\left(a+b x+c x^2\right)^{3/2}}{18 c^2 d^3 (b d+2 c d x)^{5/2}}-\frac{\left(a+b x+c x^2\right)^{5/2}}{9 c d (b d+2 c d x)^{9/2}}+\frac{\left(b^2-4 a c\right)^{3/4} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{12 c^4 d^{11/2} \sqrt{a+b x+c x^2}}-\frac{\left(b^2-4 a c\right)^{3/4} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{12 c^4 d^{11/2} \sqrt{a+b x+c x^2}}$$

Result (type 4, 251 leaves):

$$\left(-\frac{1}{3 c^3}(b+2 c x) (a+x (b+c x)) \left(3 b^4+26 b^3 c x+8 b c^2 x \left(2 a+15 c x^2\right)+2 b^2 c \left(a+43 c x^2\right)+4 c^2 \left(a^2+4 a c x^2+15 c^2 x^4\right)\right)+\left(i (b+2 c x)^7 \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \left(\text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]-\text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right)\Bigg/\left(c^4 \left(-\frac{b+2 c x}{\sqrt{b^2-4 a c}}\right)^{3/2}\right)\right)\Bigg/\left(12 (d (b+2 c x))^{11/2} \sqrt{a+x (b+c x)}\right)$$

Problem 1362: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x+c x^2\right)^{5/2}}{(b d+2 c d x)^{15/2}}\, dx$$

Optimal (type 4, 357 leaves, 10 steps):

$$-\frac{\sqrt{a+b x+c x^2}}{156 c^3 d^5 (b d+2 c d x)^{5/2}}+\frac{\sqrt{a+b x+c x^2}}{78 c^3 \left(b^2-4 a c\right) d^7 \sqrt{b d+2 c d x}}-\frac{5 \left(a+b x+c x^2\right)^{3/2}}{234 c^2 d^3 (b d+2 c d x)^{9/2}}-\frac{\left(a+b x+c x^2\right)^{5/2}}{13 c d (b d+2 c d x)^{13/2}}-\frac{\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{156 c^4 \left(b^2-4 a c\right)^{1/4} d^{15/2} \sqrt{a+b x+c x^2}}+\frac{\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]}{156 c^4 \left(b^2-4 a c\right)^{1/4} d^{15/2} \sqrt{a+b x+c x^2}}$$

Result (type 4, 254 leaves):

$$\left(-\left(\left(\left(b+2\,c\,x\right)\,\left(a+x\,\left(b+c\,x\right)\right)\,\left(9\,\left(b^2-4\,a\,c\right)^3-28\,\left(b^2-4\,a\,c\right)^2\,\left(b+2\,c\,x\right)^2+31\,\left(b^2-4\,a\,c\right)\,\left(b+2\,c\,x\right)^4-24\,\left(b+2\,c\,x\right)^6\right)\right)\Big/\left(12\,c^3\,\left(b^2-4\,a\,c\right)\right)\right)-\frac{1}{c^4}\,\mathrm{i}\,\left(b+2\,c\,x\right)^7\,\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{c\,\left(a+x\,\left(b+c\,x\right)\right)}{-b^2+4\,a\,c}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\Big/\left(156\,\left(d\,\left(b+2\,c\,x\right)\right)^{15/2}\,\sqrt{a+x\,\left(b+c\,x\right)}\right)$$

Problem 1363: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 174 leaves, 5 steps):

$$\frac{20}{21}\,\left(b^2-4\,a\,c\right)\,d^3\,\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}+\frac{4}{7}\,d\,\left(b\,d+2\,c\,d\,x\right)^{5/2}\,\sqrt{a+b\,x+c\,x^2}+\left(10\,\left(b^2-4\,a\,c\right)^{9/4}\,d^{7/2}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],-1\right]\right)\Big/\left(21\,c\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 176 leaves):

$$\left(\left(d\,\left(b+2\,c\,x\right)\right)^{7/2}\,\left(\frac{16\,\left(a+x\,\left(b+c\,x\right)\right)\,\left(2\,b^2+3\,b\,c\,x+c\,\left(-5\,a+3\,c\,x^2\right)\right)}{\left(b+2\,c\,x\right)^3}+\left(10\,\mathrm{i}\,\left(b^2-4\,a\,c\right)^2\,\sqrt{\frac{c\,\left(a+x\,\left(b+c\,x\right)\right)}{\left(b+2\,c\,x\right)^2}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/\left(c\,\sqrt{-\sqrt{b^2-4\,a\,c}}\,\left(b+2\,c\,x\right)^{5/2}\right)\right)\right)\Big/\left(21\,\sqrt{a+x\,\left(b+c\,x\right)}\right)$$

Problem 1364: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 144 leaves):

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

Problem 1365: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 97 leaves, 3 steps):

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

Result (type 4, 116 leaves):

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

Problem 1366: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 167 leaves):

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

Problem 1367: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(b\,d+2\,c\,d\,x)^{9/2}\,\sqrt{a+b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 188 leaves, 5 steps):

$$\frac{4\,\sqrt{a+b\,x+c\,x^2}}{7\,(b^2-4\,a\,c)\,d\,(b\,d+2\,c\,d\,x)^{7/2}}+\frac{20\,\sqrt{a+b\,x+c\,x^2}}{21\,(b^2-4\,a\,c)^2\,d^3\,(b\,d+2\,c\,d\,x)^{3/2}}+\frac{10\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\,\sqrt{d}}\right],-1\right]}{21\,c\,(b^2-4\,a\,c)^{7/4}\,d^{9/2}\,\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 172 leaves):

$$\left(2\left(2\,(b+2\,c\,x)\,(a+x\,(b+c\,x))\,\left(3\,(b^2-4\,a\,c)+5\,(b+2\,c\,x)^2\right)+\right.\right.$$
$$\left(5\,\mathrm{i}\,(b+2\,c\,x)^{11/2}\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\Big/$$
$$\left.\left.\left(c\sqrt{-\sqrt{b^2-4\,a\,c}}\right)\right)\right)\Big/\left(21\,(b^2-4\,a\,c)^2\,(d\,(b+2\,c\,x))^{9/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1368: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(b\,d+2\,c\,d\,x)^{9/2}}{\sqrt{a+b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 273 leaves, 8 steps):

$$\frac{28}{45}\,(b^2-4\,a\,c)\,d^3\,(b\,d+2\,c\,d\,x)^{3/2}\sqrt{a+b\,x+c\,x^2}+\frac{4}{9}\,d\,(b\,d+2\,c\,d\,x)^{7/2}\sqrt{a+b\,x+c\,x^2}+$$
$$\left(14\,(b^2-4\,a\,c)^{11/4}\,d^{9/2}\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/$$
$$\left(15\,c\sqrt{a+b\,x+c\,x^2}\right)-$$
$$\left(14\,(b^2-4\,a\,c)^{11/4}\,d^{9/2}\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]\right)\Big/$$
$$\left(15\,c\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 205 leaves):

$$\left(2\,(d\,(b+2\,c\,x))^{9/2}\left(8\,(a+x\,(b+c\,x))\,\left(3\,b^2+5\,b\,c\,x+c\,(-7\,a+5\,c\,x^2)\right)+\right.\right.$$
$$\left(21\,\mathrm{i}\,(b^2-4\,a\,c)^2\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\right.\right.$$
$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\Big/$$
$$\left.\left.\left(c\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/2}\right)\right)\right)\Big/\left(45\,(b+2\,c\,x)^3\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1369: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 231 leaves, 7 steps):

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

Result (type 4, 248 leaves):

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

Problem 1370: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 195 leaves, 6 steps):

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

Result (type 4, 151 leaves):

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

Problem 1371: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 237 leaves, 7 steps):

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

Result (type 4, 243 leaves):

$$-\left(\left(2\,i\left(2\,i\,c\,(a+x\,(b+c\,x))+\left(b^2-4\,a\,c\right)\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\right.\right.\right.$$

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

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

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

Problem 1372: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 287 leaves, 8 steps):

$$\frac{4\sqrt{a+b\,x+c\,x^2}}{5\left(b^2-4\,a\,c\right)d\,(b\,d+2\,c\,d\,x)^{5/2}}+\frac{12\sqrt{a+b\,x+c\,x^2}}{5\left(b^2-4\,a\,c\right)^2d^3\sqrt{b\,d+2\,c\,d\,x}}-$$

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

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

Result (type 4, 206 leaves):

$$\left(2\left(8\,(a+x\,(b+c\,x))\left(b^2+3\,b\,c\,x+c\left(-a+3\,c\,x^2\right)\right)-\right.\right.$$

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

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

$$\left(5\left(b^2-4\,a\,c\right)^2d\,(d\,(b+2\,c\,x))^{5/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1379: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(b d+2 c d x)^{11/2}}{\left(a+b x+c x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 205 leaves, 6 steps):

$$-\frac{2 d (b d+2 c d x)^{9/2}}{\sqrt{a+b x+c x^2}}+\frac{120}{7} c \left(b^2-4 a c\right) d^5 \sqrt{b d+2 c d x} \sqrt{a+b x+c x^2}+\frac{72}{7} c d^3 (b d+2 c d x)^{5/2} \sqrt{a+b x+c x^2}+\frac{1}{7 \sqrt{a+b x+c x^2}} 60 \left(b^2-4 a c\right)^{9/4} d^{11/2} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]$$

Result (type 4, 202 leaves):

$$\left((d (b+2 c x))^{11/2} \left(\frac{1}{(b+2 c x)^5} 2 (a+x (b+c x)) \left(-8 c \left(-5 b^2+16 a c\right)+32 b c^2 x+32 c^3 x^2-\frac{7 \left(b^2-4 a c\right)^2}{a+x (b+c x)}\right)+\left(60\, i \left(b^2-4 a c\right)^2 \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right) \Big/ \left(\sqrt{-\sqrt{b^2-4 a c}}\, (b+2 c x)^{9/2}\right)\right)\right) \Big/ \left(7 \sqrt{a+x (b+c x)}\right)$$

Problem 1380: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 162 leaves, 5 steps):

$$-\frac{2 d (b d+2 c d x)^{5/2}}{\sqrt{a+b x+c x^2}}+\frac{40}{3} c d^3 \sqrt{b d+2 c d x} \sqrt{a+b x+c x^2}+\frac{1}{3 \sqrt{a+b x+c x^2}} 20 \left(b^2-4 a c\right)^{5/4} d^{7/2} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]$$

Result (type 4, 175 leaves):

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

Problem 1381: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 125 leaves, 4 steps):

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

Result (type 4, 138 leaves):

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

Problem 1382: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 150 leaves):

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

Problem 1383: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 184 leaves, 5 steps):

$$-\frac{2}{(b^2-4\,a\,c)\,d\,(b\,d+2\,c\,d\,x)^{3/2}\,\sqrt{a+b\,x+c\,x^2}}-\frac{40\,c\,\sqrt{a+b\,x+c\,x^2}}{3\,(b^2-4\,a\,c)^2\,d\,(b\,d+2\,c\,d\,x)^{3/2}}-\frac{20\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\,\sqrt{d}}\right],-1\right]}{3\,(b^2-4\,a\,c)^{7/4}\,d^{5/2}\,\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 177 leaves):

$$-\left(\left(2\left(\sqrt{-\sqrt{b^2-4\,a\,c}}\,\left(3\,b^2+20\,b\,c\,x+4\,c\,(2\,a+5\,c\,x^2)\right)+10\,i\,(b+2\,c\,x)^{5/2}\,\sqrt{\frac{c\,(a+x\,(b+c\,x))}{(b+2\,c\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4\,a\,c}}}{\sqrt{b+2\,c\,x}}\right],-1\right]\right)\right)\Big/\left(3\,\sqrt{-\sqrt{b^2-4\,a\,c}}\,(b^2-4\,a\,c)^2\,d\,(d\,(b+2\,c\,x))^{3/2}\,\sqrt{a+x\,(b+c\,x)}\right)\right)$$

Problem 1384: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(b\,d+2\,c\,d\,x)^{9/2}}{(a+b\,x+c\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 258 leaves, 8 steps):

$$-\frac{2 d (b d+2 c d x)^{7/2}}{\sqrt{a+b x+c x^2}}+\frac{56}{5} c d^3 (b d+2 c d x)^{3/2} \sqrt{a+b x+c x^2}+\frac{1}{5 \sqrt{a+b x+c x^2}} 84 \left(b^2-4 a c\right)^{7/4} d^{9/2} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]-\frac{1}{5 \sqrt{a+b x+c x^2}} 84 \left(b^2-4 a c\right)^{7/4} d^{9/2} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4} \sqrt{d}}\right],-1\right]$$

Result (type 4, 258 leaves):

$$-\left(\left(2 d^5 \sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}} \left(\frac{(b+2 c x)^2 \left(5 b^2-8 b c x-4 c \left(7 a+2 c x^2\right)\right)}{\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}}-42 i \left(b^2-4 a c\right)^2 \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]+42 i \left(b^2-4 a c\right)^2 \sqrt{\frac{c (a+x (b+c x))}{-b^2+4 a c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{b+2 c x}{\sqrt{b^2-4 a c}}}\right],-1\right]\right)\right) \Big/ \left(5 \sqrt{d (b+2 c x)} \sqrt{a+x (b+c x)}\right)\right)$$

Problem 1385: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 219 leaves, 7 steps):

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

Result (type 4, 229 leaves) :

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

Problem 1386: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 231 leaves, 7 steps) :

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

Result (type 4, 238 leaves) :

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

Problem 1387: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 274 leaves, 8 steps):

$$-\frac{2}{(b^2-4\,a\,c)\,d\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}}-\frac{24\,c\sqrt{a+b\,x+c\,x^2}}{(b^2-4\,a\,c)^2\,d\sqrt{b\,d+2\,c\,d\,x}}+\frac{12\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]}{(b^2-4\,a\,c)^{5/4}\,d^{3/2}\sqrt{a+b\,x+c\,x^2}}-\frac{12\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]}{(b^2-4\,a\,c)^{5/4}\,d^{3/2}\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 253 leaves):

$$\left(2\,i\left(i\left(b^2+12\,b\,c\,x+4\,c\left(2\,a+3\,c\,x^2\right)\right)+6\left(b^2-4\,a\,c\right)\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{c\left(a+x\left(b+c\,x\right)\right)}{-b^2+4\,a\,c}}\right.\right.$$

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

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

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

Problem 1388: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 325 leaves, 9 steps):

$$-\frac{2}{\left(b^2-4\,a\,c\right)d\left(b\,d+2\,c\,d\,x\right)^{5/2}\sqrt{a+b\,x+c\,x^2}}-\frac{56\,c\,\sqrt{a+b\,x+c\,x^2}}{5\left(b^2-4\,a\,c\right)^2 d\left(b\,d+2\,c\,d\,x\right)^{5/2}}-$$

$$\frac{168\,c\,\sqrt{a+b\,x+c\,x^2}}{5\left(b^2-4\,a\,c\right)^3 d^3\sqrt{b\,d+2\,c\,d\,x}}+\frac{84\,\sqrt{-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]}{5\left(b^2-4\,a\,c\right)^{9/4}d^{7/2}\sqrt{a+b\,x+c\,x^2}}-$$

$$\frac{84\,\sqrt{-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\sqrt{d}}\right],-1\right]}{5\left(b^2-4\,a\,c\right)^{9/4}d^{7/2}\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 221 leaves):

$$\left(2\left(-5\,(b+2\,c\,x)^4-8\,c\,(b^2-4\,a\,c)\,(a+x\,(b+c\,x))-64\,c\,(b+2\,c\,x)^2\,(a+x\,(b+c\,x))+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/2}}42\,i\,(b+2\,c\,x)^4\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(5\,(b^2-4\,a\,c)^3\,d\,(d\,(b+2\,c\,x))^{5/2}\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1389: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(b\,d+2\,c\,d\,x)^{15/2}}{(a+b\,x+c\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 247 leaves, 7 steps):

$$-\frac{2\,d\,(b\,d+2\,c\,d\,x)^{13/2}}{3\,(a+b\,x+c\,x^2)^{3/2}}-\frac{52\,c\,d^3\,(b\,d+2\,c\,d\,x)^{9/2}}{3\sqrt{a+b\,x+c\,x^2}}+\frac{1040}{7}\,c^2\,(b^2-4\,a\,c)\,d^7\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}+\frac{624}{7}\,c^2\,d^5\,(b\,d+2\,c\,d\,x)^{5/2}\sqrt{a+b\,x+c\,x^2}+\frac{1}{7\sqrt{a+b\,x+c\,x^2}}520\,c\,(b^2-4\,a\,c)^{9/4}\,d^{15/2}\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\sqrt{d}}\right],-1\right]$$

Result (type 4, 231 leaves):

$$\left((d (b+2 c x))^{15/2} \left(\frac{1}{3 (b+2 c x)^7} 2 (a+x (b+c x)) \left(-64 c^2 (-11 b^2+38 a c)+384 b c^3 x+384 c^4 x^2-\frac{7 (b^2-4 a c)^3}{(a+x (b+c x))^2}-\frac{266 c (b^2-4 a c)^2}{a+x (b+c x)}\right)+\left(520 i c (b^2-4 a c)^2 \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4 a c}} (b+2 c x)^{13/2}\right)\right)\right)\Big/\left(7 \sqrt{a+x (b+c x)}\right)$$

Problem 1390: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(b d+2 c d x)^{11/2}}{(a+b x+c x^2)^{5/2}} \, dx$$

Optimal (type 4, 196 leaves, 6 steps):

$$-\frac{2 d (b d+2 c d x)^{9/2}}{3 (a+b x+c x^2)^{3/2}}-\frac{12 c d^3 (b d+2 c d x)^{5/2}}{\sqrt{a+b x+c x^2}}+80 c^2 d^5 \sqrt{b d+2 c d x} \sqrt{a+b x+c x^2}+\frac{1}{\sqrt{a+b x+c x^2}} 40 c (b^2-4 a c)^{5/4} d^{11/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]$$

Result (type 4, 201 leaves):

$$\frac{1}{\sqrt{a+x (b+c x)}} (d (b+2 c x))^{11/2} \left(\frac{2 (a+x (b+c x)) \left(32 c^2-\frac{(b^2-4 a c)^2}{(a+x (b+c x))^2}+\frac{26 c (-b^2+4 a c)}{a+x (b+c x)}\right)}{3 (b+2 c x)^5}+\left(40 i c (b^2-4 a c) \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\Big/\left(\sqrt{-\sqrt{b^2-4 a c}} (b+2 c x)^{9/2}\right)\right)$$

Problem 1391: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(b d+2 c d x)^{7/2}}{(a+b x+c x^2)^{5/2}} \, dx$$

Optimal (type 4, 165 leaves, 5 steps):

$$-\frac{2 d (b d+2 c d x)^{5/2}}{3 (a+b x+c x^2)^{3/2}}-\frac{20 c d^3 \sqrt{b d+2 c d x}}{3 \sqrt{a+b x+c x^2}}+\frac{1}{3 \sqrt{a+b x+c x^2}}$$

$$40 c (b^2-4 a c)^{1/4} d^{7/2} \sqrt{-\frac{c (a+b x+c x^2)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{(b^2-4 a c)^{1/4} \sqrt{d}}\right],-1\right]$$

Result (type 4, 165 leaves):

$$\left((d (b+2 c x))^{7/2} \left(-\frac{2 (b^2+14 b c x+2 c (5 a+7 c x^2))}{(b+2 c x)^3 (a+x (b+c x))}+\frac{40 i c \sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]}{\sqrt{-\sqrt{b^2-4 a c}}\ (b+2 c x)^{5/2}}\right)\right)\Big/\left(3 \sqrt{a+x (b+c x)}\right)$$

Problem 1392: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 173 leaves, 5 steps):

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

Result (type 4, 168 leaves):

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

Problem 1393: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 187 leaves, 5 steps):

$$-\frac{2\sqrt{b d+2 c d x}}{3\left(b^2-4 a c\right) d\left(a+b x+c x^2\right)^{3/2}}+\frac{20 c\sqrt{b d+2 c d x}}{3\left(b^2-4 a c\right)^2 d\sqrt{a+b x+c x^2}}+\frac{40 c\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4}\sqrt{d}}\right],-1\right]}{3\left(b^2-4 a c\right)^{7/4}\sqrt{d}\sqrt{a+b x+c x^2}}$$

Result (type 4, 168 leaves):

$$\left(2\left(-\frac{(b+2 c x)\left(b^2-14 a c-10 c x (b+c x)\right)}{a+x (b+c x)}+\frac{1}{\sqrt{-\sqrt{b^2-4 a c}}}20\, i\, c\,(b+2 c x)^{3/2}\sqrt{\frac{c (a+x (b+c x))}{(b+2 c x)^2}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4 a c}}}{\sqrt{b+2 c x}}\right],-1\right]\right)\right)\Big/\left(3\left(b^2-4 a c\right)^2\sqrt{d (b+2 c x)}\sqrt{a+x (b+c x)}\right)$$

Problem 1394: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 228 leaves, 6 steps):

$$-\frac{2}{3\left(b^2-4 a c\right) d\,(b d+2 c d x)^{3/2}\left(a+b x+c x^2\right)^{3/2}}+\frac{12 c}{\left(b^2-4 a c\right)^2 d\,(b d+2 c d x)^{3/2}\sqrt{a+b x+c x^2}}+\frac{80 c^2\sqrt{a+b x+c x^2}}{\left(b^2-4 a c\right)^3 d\,(b d+2 c d x)^{3/2}}+\frac{40 c\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b d+2 c d x}}{\left(b^2-4 a c\right)^{1/4}\sqrt{d}}\right],-1\right]}{\left(b^2-4 a c\right)^{11/4} d^{5/2}\sqrt{a+b x+c x^2}}$$

Result (type 4, 200 leaves):

$$\left(2\left((b+2cx)^3 (a+x(b+cx))\left(\frac{32c^2}{(b+2cx)^2}+\frac{-b^2+4ac}{(a+x(b+cx))^2}+\frac{22c}{a+x(b+cx)}\right)+\frac{1}{\sqrt{-\sqrt{b^2-4ac}}}60\,\mathrm{i}\,c\,(b+2cx)^{7/2}\sqrt{\frac{c(a+x(b+cx))}{(b+2cx)^2}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{-\sqrt{b^2-4ac}}}{\sqrt{b+2cx}}\right],-1\right]\right)\right)\Big/\left(3\left(b^2-4ac\right)^3(d(b+2cx))^{5/2}\sqrt{a+x(b+cx)}\right)$$

Problem 1395: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(b d+2 c d x)^{13/2}}{\left(a+b x+c x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 299 leaves, 9 steps):

$$-\frac{2d(bd+2cdx)^{11/2}}{3\left(a+bx+cx^2\right)^{3/2}}-\frac{44cd^3(bd+2cdx)^{7/2}}{3\sqrt{a+bx+cx^2}}+\frac{1232}{15}c^2d^5(bd+2cdx)^{3/2}\sqrt{a+bx+cx^2}+\frac{1}{5\sqrt{a+bx+cx^2}}616c\left(b^2-4ac\right)^{7/4}d^{13/2}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{bd+2cdx}}{\left(b^2-4ac\right)^{1/4}\sqrt{d}}\right],-1\right]-\frac{1}{5\sqrt{a+bx+cx^2}}616c\left(b^2-4ac\right)^{7/4}d^{13/2}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{bd+2cdx}}{\left(b^2-4ac\right)^{1/4}\sqrt{d}}\right],-1\right]$$

Result (type 4, 251 leaves):

$$\left(2\,(d\,(b+2\,c\,x))^{13/2}\left(\frac{1}{a+x\,(b+c\,x)}\left(-5\,b^4-150\,b^3\,c\,x+24\,b\,c^2\,x\,(33\,a+8\,c\,x^2)-2\,b^2\,c\,(55\,a+27\,c\,x^2)+8\,c^2\,(77\,a^2+99\,a\,c\,x^2+12\,c^2\,x^4)\right)+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/2}}924\,i\,c\,(b^2-4\,a\,c)\,\sqrt{\frac{c\,(a+x\,(b+c\,x))}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]\right)\right)\right)\Big/\left(15\,(b+2\,c\,x)^5\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 1396: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(b\,d+2\,c\,d\,x)^{9/2}}{(a+b\,x+c\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 258 leaves, 8 steps):

$$-\frac{2\,d\,(b\,d+2\,c\,d\,x)^{7/2}}{3\,(a+b\,x+c\,x^2)^{3/2}}-\frac{28\,c\,d^3\,(b\,d+2\,c\,d\,x)^{3/2}}{3\,\sqrt{a+b\,x+c\,x^2}}+\frac{1}{\sqrt{a+b\,x+c\,x^2}}56\,c\,(b^2-4\,a\,c)^{3/4}\,d^{9/2}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\,\sqrt{d}}\right],-1\right]-\frac{1}{\sqrt{a+b\,x+c\,x^2}}56\,c\,(b^2-4\,a\,c)^{3/4}\,d^{9/2}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{(b^2-4\,a\,c)^{1/4}\,\sqrt{d}}\right],-1\right]$$

Result (type 4, 194 leaves):

$$\left(2\,\left(d\,\left(b+2\,c\,x\right)\right)^{9/2}\left(-\frac{b^2+18\,b\,c\,x+2\,c\,\left(7\,a+9\,c\,x^2\right)}{a+x\,\left(b+c\,x\right)}+\frac{1}{\left(-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/2}}\right.\right.$$

$$84\,\mathrm{i}\,c\,\sqrt{\frac{c\,\left(a+x\,\left(b+c\,x\right)\right)}{-b^2+4\,a\,c}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}\right],-1\right]-\right.$$

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

Problem 1397: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 264 leaves, 8 steps):

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

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

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

Result (type 4, 218 leaves):

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

Problem 1398: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 278 leaves, 8 steps):

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

Result (type 4, 222 leaves):

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

Problem 1399: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 325 leaves, 9 steps):

$$-\frac{2}{3\,\left(b^2-4\,a\,c\right)\,d\,\sqrt{b\,d+2\,c\,d\,x}\,\left(a+b\,x+c\,x^2\right)^{3/2}}+\frac{28\,c}{3\,\left(b^2-4\,a\,c\right)^2\,d\,\sqrt{b\,d+2\,c\,d\,x}\,\sqrt{a+b\,x+c\,x^2}}+\frac{112\,c^2\,\sqrt{a+b\,x+c\,x^2}}{\left(b^2-4\,a\,c\right)^3\,d\,\sqrt{b\,d+2\,c\,d\,x}}-\frac{56\,c\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],-1\right]}{\left(b^2-4\,a\,c\right)^{9/4}\,d^{3/2}\,\sqrt{a+b\,x+c\,x^2}}+\frac{56\,c\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,d+2\,c\,d\,x}}{\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{d}}\right],-1\right]}{\left(b^2-4\,a\,c\right)^{9/4}\,d^{3/2}\,\sqrt{a+b\,x+c\,x^2}}$$

Result (type 4, 270 leaves):

$$\left(-\frac{1}{3\left(b^2-4ac\right)^3}2\left(b+2cx\right)\left(a+x\left(b+cx\right)\right)\right.$$
$$\left(b^4-14b^3cx-56bc^2x\left(5a+6cx^2\right)-2b^2c\left(11a+91cx^2\right)-8c^2\left(12a^2+35acx^2+21c^2x^4\right)\right)+$$
$$\frac{1}{\left(b^2-4ac\right)^{3/2}}56\,i\,c\left(-\frac{b+2cx}{\sqrt{b^2-4ac}}\right)^{3/2}\left(a+x\left(b+cx\right)\right)^2\sqrt{\frac{c\left(a+x\left(b+cx\right)\right)}{-b^2+4ac}}$$
$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2cx}{\sqrt{b^2-4ac}}}\right],-1\right]-\right.$$
$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{b+2cx}{\sqrt{b^2-4ac}}}\right],-1\right]\right)\right)\Big/\left(\left(d\left(b+2cx\right)\right)^{3/2}\left(a+x\left(b+cx\right)\right)^{5/2}\right)$$

Problem 1403: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{ce+dex}\,\sqrt{1-c^2-2cdx-d^2x^2}}\,dx$$

Optimal (type 4, 31 leaves, 2 steps):

$$\frac{2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{ce+dex}}{\sqrt{e}}\right],-1\right]}{d\sqrt{e}}$$

Result (type 4, 67 leaves):

$$-\frac{2\left(c+dx\right)^{3/2}\sqrt{1-\frac{1}{(c+dx)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{\sqrt{c+dx}}\right],-1\right]}{d\sqrt{e\left(c+dx\right)}\,\sqrt{1-\left(c+dx\right)^2}}$$

Problem 1412: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+bx+cx^2\right)^{4/3}}{\left(bd+2cdx\right)^{11/3}}\,dx$$

Optimal (type 3, 468 leaves, 14 steps):

$$-\frac{3\left(d\left(b+2cx\right)\right)^{4/3}\left(a+bx+cx^2\right)^{1/3}}{16c^2\left(b^2-4ac\right)d^5}+\frac{9\left(d\left(b+2cx\right)\right)^{4/3}\left(a+bx+cx^2\right)^{4/3}}{16c\left(b^2-4ac\right)^2d^5}+$$
$$\frac{3\left(a+bx+cx^2\right)^{7/3}}{4\left(b^2-4ac\right)d\left(bd+2cdx\right)^{8/3}}-\frac{9\left(a+bx+cx^2\right)^{7/3}}{4\left(b^2-4ac\right)^2d^3\left(bd+2cdx\right)^{2/3}}-$$
$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{c^{1/3}d^{2/3}+\frac{2^{1/3}\left(d\left(b+2cx\right)\right)^{2/3}}{\left(a+bx+cx^2\right)^{1/3}}}{\sqrt{3}\,c^{1/3}d^{2/3}}\right]}{16\times2^{2/3}c^{7/3}d^{11/3}}-\frac{\text{Log}\left[-\frac{2^{1/3}\left(d\left(b+2cx\right)\right)^{2/3}-2c^{1/3}d^{2/3}\left(a+bx+cx^2\right)^{1/3}}{\left(a+bx+cx^2\right)^{1/3}}\right]}{16\times2^{2/3}c^{7/3}d^{11/3}}+$$
$$\frac{1}{32\times2^{2/3}c^{7/3}d^{11/3}}\text{Log}\left[\left(\left(d\left(b+2cx\right)\right)^{4/3}+2^{2/3}c^{1/3}d^{2/3}\left(d\left(b+2cx\right)\right)^{2/3}\left(a+bx+cx^2\right)^{1/3}+\right.\right.$$
$$\left.\left.2\times2^{1/3}c^{2/3}d^{4/3}\left(a+bx+cx^2\right)^{2/3}\right)\Big/\left(a+bx+cx^2\right)^{2/3}\right]$$

Result (type 5, 167 leaves):

$$\left(-24c\left(a^2c+a\left(b^2+6bcx+6c^2x^2\right)+x\left(b^3+6b^2cx+10bc^2x^2+5c^3x^3\right)\right)+\right.$$
$$\left.6\times2^{1/3}\left(b+2cx\right)^4\left(\frac{c\left(a+x\left(b+cx\right)\right)}{-b^2+4ac}\right)^{2/3}\text{HypergeometricPFQ}\left[\left\{\frac{2}{3},\frac{2}{3}\right\},\left\{\frac{5}{3}\right\},\frac{\left(b+2cx\right)^2}{b^2-4ac}\right]\right)\Big/$$
$$\left(128c^3d\left(d\left(b+2cx\right)\right)^{8/3}\left(a+x\left(b+cx\right)\right)^{2/3}\right)$$

Problem 1416: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 597 leaves, 6 steps):

$$-\frac{\left(b^2-4ac\right)\left(d\left(b+2cx\right)\right)^{1/3}\left(a+bx+cx^2\right)^{1/3}}{9c^2d}+$$

$$\frac{\left(d\left(b+2cx\right)\right)^{1/3}\left(a+bx+cx^2\right)^{4/3}}{6cd}+\left(\left(b^2-4ac\right)\left(d\left(b+2cx\right)\right)^{1/3}\left(b^2-4ac-\left(b+2cx\right)^2\right)\right.$$

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

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{2^{2/3}c^{1/3}d^{2/3}-\frac{\left(1-\sqrt{3}\right)\left(d\left(b+2cx\right)\right)^{2/3}}{\left(a+bx+cx^2\right)^{1/3}}}{2^{2/3}c^{1/3}d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2cx\right)\right)^{2/3}}{\left(a+bx+cx^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(72\times 3^{1/4}c^{10/3}d^{5/3}\left(a+bx+cx^2\right)^{2/3}\sqrt{-\frac{\left(d\left(b+2cx\right)\right)^{2/3}\left(2^{2/3}c^{1/3}d^{2/3}-\frac{\left(d\left(b+2cx\right)\right)^{2/3}}{\left(a+bx+cx^2\right)^{1/3}}\right)}{\left(a+bx+cx^2\right)^{1/3}\left(2^{2/3}c^{1/3}d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2cx\right)\right)^{2/3}}{\left(a+bx+cx^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 171 leaves):

$$\left(\left(d\left(b+2cx\right)\right)^{1/3}\left(c\left(11a^2c-2a\left(b^2-7bcx-7c^2x^2\right)+x\left(-2b^3+b^2cx+6bc^2x^2+3c^3x^3\right)\right)+\right.\right.$$

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

$$\left.\left.\text{HypergeometricPFQ}\left[\left\{\frac{1}{6},\frac{2}{3}\right\},\left\{\frac{7}{6}\right\},\frac{\left(b+2cx\right)^2}{b^2-4ac}\right]\right)\right)\Bigg/\left(18c^3d\left(a+x\left(b+cx\right)\right)^{2/3}\right)$$

Problem 1417: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+bx+cx^2\right)^{4/3}}{\left(bd+2cdx\right)^{8/3}}\,dx$$

Optimal (type 4, 581 leaves, 6 steps):

$$\frac{(d\,(b+2\,c\,x))^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}{5\,c^2\,d^3}-\frac{3\,(a+b\,x+c\,x^2)^{4/3}}{10\,c\,d\,(d\,(b+2\,c\,x))^{5/3}}-$$

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

$$\sqrt{\frac{2\times2^{1/3}\,c^{2/3}\,d^{4/3}+\frac{(d\,(b+2\,c\,x))^{4/3}}{(a+b\,x+c\,x^2)^{2/3}}+\frac{2^{2/3}\,c^{1/3}\,d^{2/3}\,(d\,(b+2\,c\,x))^{2/3}}{(a+b\,x+c\,x^2)^{1/3}}}{\left(2^{2/3}\,c^{1/3}\,d^{2/3}-\frac{\left(1+\sqrt{3}\right)\,(d\,(b+2\,c\,x))^{2/3}}{(a+b\,x+c\,x^2)^{1/3}}\right)^2}}$$

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

$$\left(40\times3^{1/4}\,c^{10/3}\,d^{11/3}\,(a+b\,x+c\,x^2)^{2/3}\,\sqrt{-\frac{(d\,(b+2\,c\,x))^{2/3}\,\left(2^{2/3}\,c^{1/3}\,d^{2/3}-\frac{(d\,(b+2\,c\,x))^{2/3}}{(a+b\,x+c\,x^2)^{1/3}}\right)}{(a+b\,x+c\,x^2)^{1/3}\,\left(2^{2/3}\,c^{1/3}\,d^{2/3}-\frac{\left(1+\sqrt{3}\right)\,(d\,(b+2\,c\,x))^{2/3}}{(a+b\,x+c\,x^2)^{1/3}}\right)^2}}\right)$$

Result (type 5, 145 leaves):

$$\left((b+2\,c\,x)^3\,\left(c\,(a+x\,(b+c\,x))\,\left(5+\frac{3\,(b^2-4\,a\,c)}{(b+2\,c\,x)^2}\right)-8\times2^{1/3}\,(b^2-4\,a\,c)\right.\right.$$

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

$$\left(40\,c^3\,(d\,(b+2\,c\,x))^{8/3}\,(a+x\,(b+c\,x))^{2/3}\right)$$

Problem 1418: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 591 leaves, 6 steps):

$$-\frac{3\left(a+b x+c x^2\right)^{1/3}}{55 c^2 d^3\left(d\left(b+2 c x\right)\right)^{5/3}}-\frac{3\left(a+b x+c x^2\right)^{4/3}}{22 c d\left(d\left(b+2 c x\right)\right)^{11/3}}+$$

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

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

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1-\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}}{2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(440 c^{10/3}\right.$$

$$\left.\left(b^2-4 a c\right) d^{17/3}\left(a+b x+c x^2\right)^{2/3}\sqrt{-\frac{\left(d\left(b+2 c x\right)\right)^{2/3}\left(2^{2/3} c^{1/3} d^{2/3}-\frac{\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}\right)}{\left(a+b x+c x^2\right)^{1/3}\left(2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 179 leaves):

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

$$\left(-3 c\left(5 a^2 c+2 a\left(b^2+9 b c x+9 c^2 x^2\right)+x\left(2 b^3+15 b^2 c x+26 b c^2 x^2+13 c^3 x^3\right)\right)+6\times 2^{1/3}\right.$$

$$\left.\left.\left(b+2 c x\right)^4\left(\frac{c\left(a+x\left(b+c x\right)\right)}{-b^2+4 a c}\right)^{2/3}\text{HypergeometricPFQ}\left[\left\{\frac{1}{6},\frac{2}{3}\right\},\left\{\frac{7}{6}\right\},\frac{\left(b+2 c x\right)^2}{b^2-4 a c}\right]\right)\right)\Bigg/$$

$$\left(110 c^3 d^5\left(b+2 c x\right)^4\left(a+x\left(b+c x\right)\right)^{2/3}\right)$$

Problem 1419: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b x+c x^2\right)^{4/3}}{\left(b d+2 c d x\right)^{20/3}}\,dx$$

Optimal (type 4, 637 leaves, 7 steps):

$$-\frac{3\left(a+b x+c x^2\right)^{1/3}}{187 c^2 d^3 \left(d \left(b+2 c x\right)\right)^{11/3}}+\frac{6\left(a+b x+c x^2\right)^{1/3}}{935 c^2 \left(b^2-4 a c\right) d^5 \left(d \left(b+2 c x\right)\right)^{5/3}}-$$

$$\frac{3\left(a+b x+c x^2\right)^{4/3}}{34 c d \left(d \left(b+2 c x\right)\right)^{17/3}}+\left(3\times 3^{3/4} \left(d \left(b+2 c x\right)\right)^{1/3} \left(b^2-4 a c-\left(b+2 c x\right)^2\right)\right.$$

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

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1-\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}}{2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(7480 c^{10/3}\right.$$

$$\left.\left(b^2-4 a c\right)^2 d^{23/3} \left(a+b x+c x^2\right)^{2/3} \sqrt{-\frac{\left(d\left(b+2 c x\right)\right)^{2/3}\left(2^{2/3} c^{1/3} d^{2/3}-\frac{\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}\right)}{\left(a+b x+c x^2\right)^{1/3}\left(2^{2/3} c^{1/3} d^{2/3}-\frac{\left(1+\sqrt{3}\right)\left(d\left(b+2 c x\right)\right)^{2/3}}{\left(a+b x+c x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 170 leaves):

$$\left(3\left(c\left(a+x\left(b+c x\right)\right)\left(55\left(b^2-4 a c\right)^2-95\left(b^2-4 a c\right)\left(b+2 c x\right)^2+16\left(b+2 c x\right)^4\right)+24\times 2^{1/3}\right.\right.$$

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

$$\left(7480 c^3 \left(b^2-4 a c\right) d \left(d\left(b+2 c x\right)\right)^{17/3} \left(a+x\left(b+c x\right)\right)^{2/3}\right)$$

Problem 1423: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 141 leaves, 2 steps):

$$-\frac{\left(b^2-4 a c\right)^3 \left(b d+2 c d x\right)^{1+m}}{128 c^4 d \left(1+m\right)}+\frac{3\left(b^2-4 a c\right)^2 \left(b d+2 c d x\right)^{3+m}}{128 c^4 d^3 \left(3+m\right)}-$$

$$\frac{3\left(b^2-4 a c\right)\left(b d+2 c d x\right)^{5+m}}{128 c^4 d^5 \left(5+m\right)}+\frac{\left(b d+2 c d x\right)^{7+m}}{128 c^4 d^7 \left(7+m\right)}$$

Result (type 3, 321 leaves):

$$-\frac{1}{8 c^4 (1+m) (3+m) (5+m) (7+m)}(b+2 c x) (d (b+2 c x))^m \left(3 b^6-6 b^5 c (1+m) x-6 b^4 c \left(a (7+m)-c \left(2+3 m+m^2\right) x^2\right)-4 b^3 c^2 (1+m) x \left(-3 a (7+m)+c \left(6+5 m+m^2\right) x^2\right)-12 b c^3 (1+m) x \left(a^2 \left(35+12 m+m^2\right)+2 a c \left(21+10 m+m^2\right) x^2+c^2 \left(15+8 m+m^2\right) x^4\right)-6 b^2 c^2 \left(-a^2 \left(35+12 m+m^2\right)+2 a c \left(14+23 m+10 m^2+m^3\right) x^2+c^2 \left(27+42 m+17 m^2+2 m^3\right) x^4\right)-4 c^3 \left(a^3 \left(105+71 m+15 m^2+m^3\right)+3 a^2 c \left(35+47 m+13 m^2+m^3\right) x^2+3 a c^2 \left(21+31 m+11 m^2+m^3\right) x^4+c^3 \left(15+23 m+9 m^2+m^3\right) x^6\right)\right)$$

Problem 1426: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 67 leaves, 2 steps):

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

Result (type 5, 186 leaves):

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

Problem 1427: Unable to integrate problem.

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

Optimal (type 5, 68 leaves, 2 steps):

$$\frac{8 c (d (b+2 c x))^{1+m} \text{Hypergeometric2F1}\left[2, \frac{1+m}{2}, \frac{3+m}{2}, \frac{(b+2 c x)^2}{b^2-4 a c}\right]}{\left(b^2-4 a c\right)^2 d (1+m)}$$

Result (type 8, 26 leaves):

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

Problem 1428: Unable to integrate problem.

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

Optimal (type 5, 70 leaves, 2 steps):

$$-\frac{32\,c^2\,(d\,(b + 2\,c\,x))^{1+m}\,\text{Hypergeometric2F1}\left[3,\frac{1+m}{2},\frac{3+m}{2},\frac{(b+2\,c\,x)^2}{b^2-4\,a\,c}\right]}{(b^2 - 4\,a\,c)^3\,d\,(1+m)}$$

Result (type 8, 26 leaves):

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

Problem 1429: Unable to integrate problem.

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

Optimal (type 5, 82 leaves, 3 steps):

$$-\left(\left(2\,(b\,d + 2\,c\,d\,x)^{1+m}\,(a + b\,x + c\,x^2)^{7/2}\,\text{Hypergeometric2F1}\left[1,\frac{8+m}{2},\frac{3+m}{2},\frac{(b+2\,c\,x)^2}{b^2-4\,a\,c}\right]\right)\Big/\left((b^2 - 4\,a\,c)\,d\,(1+m)\right)\right)$$

Result (type 8, 28 leaves):

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

Problem 1430: Unable to integrate problem.

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

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

$$-\left(\left((b\,d + 2\,c\,d\,x)^{1+m}\left(4\,a - \frac{b^2}{c} + \frac{(b+2\,c\,x)^2}{c}\right)^{5/2}\,\text{Hypergeometric2F1}\left[1,\frac{6+m}{2},\frac{3+m}{2},\frac{(b+2\,c\,x)^2}{b^2-4\,a\,c}\right]\right)\Big/\left(16\,(b^2 - 4\,a\,c)\,d\,(1+m)\right)\right)$$

Result (type 8, 28 leaves):

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

Problem 1433: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 193 leaves):

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

Problem 1451: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 65 leaves, 3 steps):

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

Result (type 1, 148 leaves):

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

Problem 1463: Result more than twice size of optimal antiderivative.

$$\int (d + e\,x)^6\,(a^2 + 2\,a\,b\,x + b^2\,x^2)^2\, dx$$

Optimal (type 1, 119 leaves, 3 steps):

$$\frac{(b d-a e)^4 (d+e x)^7}{7 e^5}-\frac{b (b d-a e)^3 (d+e x)^8}{2 e^5}+\frac{2 b^2 (b d-a e)^2 (d+e x)^9}{3 e^5}-\frac{2 b^3 (b d-a e) (d+e x)^{10}}{5 e^5}+\frac{b^4 (d+e x)^{11}}{11 e^5}$$

Result (type 1, 398 leaves):

$$a^4 d^6 x+a^3 d^5 (2 b d+3 a e) x^2+a^2 d^4 (2 b^2 d^2+8 a b d e+5 a^2 e^2) x^3+a d^3 (b^3 d^3+9 a b^2 d^2 e+15 a^2 b d e^2+5 a^3 e^3) x^4+\frac{1}{5} d^2 (b^4 d^4+24 a b^3 d^3 e+90 a^2 b^2 d^2 e^2+80 a^3 b d e^3+15 a^4 e^4) x^5+d e (b^4 d^4+10 a b^3 d^3 e+20 a^2 b^2 d^2 e^2+10 a^3 b d e^3+a^4 e^4) x^6+\frac{1}{7} e^2 (15 b^4 d^4+80 a b^3 d^3 e+90 a^2 b^2 d^2 e^2+24 a^3 b d e^3+a^4 e^4) x^7+\frac{1}{2} b e^3 (5 b^3 d^3+15 a b^2 d^2 e+9 a^2 b d e^2+a^3 e^3) x^8+\frac{1}{3} b^2 e^4 (5 b^2 d^2+8 a b d e+2 a^2 e^2) x^9+\frac{1}{5} b^3 e^5 (3 b d+2 a e) x^{10}+\frac{1}{11} b^4 e^6 x^{11}$$

Problem 1464: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^5 (a^2+2 a b x+b^2 x^2)^2 \, dx$$

Optimal (type 1, 119 leaves, 3 steps):

$$\frac{(b d-a e)^4 (d+e x)^6}{6 e^5}-\frac{4 b (b d-a e)^3 (d+e x)^7}{7 e^5}+\frac{3 b^2 (b d-a e)^2 (d+e x)^8}{4 e^5}-\frac{4 b^3 (b d-a e) (d+e x)^9}{9 e^5}+\frac{b^4 (d+e x)^{10}}{10 e^5}$$

Result (type 1, 350 leaves):

$$a^4 d^5 x+\frac{1}{2} a^3 d^4 (4 b d+5 a e) x^2+\frac{2}{3} a^2 d^3 (3 b^2 d^2+10 a b d e+5 a^2 e^2) x^3+\frac{1}{2} a d^2 (2 b^3 d^3+15 a b^2 d^2 e+20 a^2 b d e^2+5 a^3 e^3) x^4+\frac{1}{5} d (b^4 d^4+20 a b^3 d^3 e+60 a^2 b^2 d^2 e^2+40 a^3 b d e^3+5 a^4 e^4) x^5+\frac{1}{6} e (5 b^4 d^4+40 a b^3 d^3 e+60 a^2 b^2 d^2 e^2+20 a^3 b d e^3+a^4 e^4) x^6+\frac{2}{7} b e^2 (5 b^3 d^3+20 a b^2 d^2 e+15 a^2 b d e^2+2 a^3 e^3) x^7+\frac{1}{4} b^2 e^3 (5 b^2 d^2+10 a b d e+3 a^2 e^2) x^8+\frac{1}{9} b^3 e^4 (5 b d+4 a e) x^9+\frac{1}{10} b^4 e^5 x^{10}$$

Problem 1465: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x)^4\,\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^2\,dx$$

Optimal (type 1, 119 leaves, 3 steps):

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

Result (type 1, 273 leaves):

$$a^4\,d^4\,x+2\,a^3\,d^3\,(b\,d+a\,e)\,x^2+\frac{2}{3}\,a^2\,d^2\,\left(3\,b^2\,d^2+8\,a\,b\,d\,e+3\,a^2\,e^2\right)\,x^3+a\,d\,\left(b^3\,d^3+6\,a\,b^2\,d^2\,e+6\,a^2\,b\,d\,e^2+a^3\,e^3\right)\,x^4+\frac{1}{5}\,\left(b^4\,d^4+16\,a\,b^3\,d^3\,e+36\,a^2\,b^2\,d^2\,e^2+16\,a^3\,b\,d\,e^3+a^4\,e^4\right)\,x^5+\frac{2}{3}\,b\,e\,\left(b^3\,d^3+6\,a\,b^2\,d^2\,e+6\,a^2\,b\,d\,e^2+a^3\,e^3\right)\,x^6+\frac{2}{7}\,b^2\,e^2\,\left(3\,b^2\,d^2+8\,a\,b\,d\,e+3\,a^2\,e^2\right)\,x^7+\frac{1}{2}\,b^3\,e^3\,(b\,d+a\,e)\,x^8+\frac{1}{9}\,b^4\,e^4\,x^9$$

Problem 1466: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 92 leaves, 3 steps):

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

Result (type 1, 217 leaves):

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

Problem 1467: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 65 leaves, 3 steps):

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

Result (type 1, 148 leaves):

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

Problem 1468: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 38 leaves, 3 steps):

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

Result (type 1, 84 leaves):

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

Problem 1475: Result more than twice size of optimal antiderivative.

$$\int \frac{(a^2 + 2 a b x + b^2 x^2)^2}{(d + e x)^6} \, dx$$

Optimal (type 1, 28 leaves, 2 steps):

$$\frac{(a + b x)^5}{5 (b d - a e) (d + e x)^5}$$

Result (type 1, 140 leaves):

$$-\frac{1}{5 e^5 (d + e x)^5} \left(a^4 e^4 + a^3 b e^3 (d + 5 e x) + a^2 b^2 e^2 (d^2 + 5 d e x + 10 e^2 x^2) + a b^3 e (d^3 + 5 d^2 e x + 10 d e^2 x^2 + 10 e^3 x^3) + b^4 (d^4 + 5 d^3 e x + 10 d^2 e^2 x^2 + 10 d e^3 x^3 + 5 e^4 x^4)\right)$$

Problem 1476: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 58 leaves, 3 steps):

$$\frac{(a+b\,x)^5}{6\,(b\,d-a\,e)\,(d+e\,x)^6}+\frac{b\,(a+b\,x)^5}{30\,(b\,d-a\,e)^2\,(d+e\,x)^5}$$

Result (type 1, 144 leaves):

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

Problem 1481: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 173 leaves, 3 steps):

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

Result (type 1, 771 leaves):

$$a^6\,d^8\,x+a^5\,d^7\,(3\,b\,d+4\,a\,e)\,x^2+\frac{1}{3}\,a^4\,d^6\,\left(15\,b^2\,d^2+48\,a\,b\,d\,e+28\,a^2\,e^2\right)\,x^3+a^3\,d^5\,\left(5\,b^3\,d^3+30\,a\,b^2\,d^2\,e+42\,a^2\,b\,d\,e^2+14\,a^3\,e^3\right)\,x^4+\frac{1}{5}\,a^2\,d^4\,\left(15\,b^4\,d^4+160\,a\,b^3\,d^3\,e+420\,a^2\,b^2\,d^2\,e^2+336\,a^3\,b\,d\,e^3+70\,a^4\,e^4\right)\,x^5+\frac{1}{3}\,a\,d^3\,\left(3\,b^5\,d^5+60\,a\,b^4\,d^4\,e+280\,a^2\,b^3\,d^3\,e^2+420\,a^3\,b^2\,d^2\,e^3+210\,a^4\,b\,d\,e^4+28\,a^5\,e^5\right)\,x^6+\frac{1}{7}\,d^2\,\left(b^6\,d^6+48\,a\,b^5\,d^5\,e+420\,a^2\,b^4\,d^4\,e^2+1120\,a^3\,b^3\,d^3\,e^3+1050\,a^4\,b^2\,d^2\,e^4+336\,a^5\,b\,d\,e^5+28\,a^6\,e^6\right)\,x^7+d\,e\,\left(b^6\,d^6+21\,a\,b^5\,d^5\,e+105\,a^2\,b^4\,d^4\,e^2+175\,a^3\,b^3\,d^3\,e^3+105\,a^4\,b^2\,d^2\,e^4+21\,a^5\,b\,d\,e^5+a^6\,e^6\right)\,x^8+\frac{1}{9}\,e^2\,\left(28\,b^6\,d^6+336\,a\,b^5\,d^5\,e+1050\,a^2\,b^4\,d^4\,e^2+1120\,a^3\,b^3\,d^3\,e^3+420\,a^4\,b^2\,d^2\,e^4+48\,a^5\,b\,d\,e^5+a^6\,e^6\right)\,x^9+\frac{1}{5}\,b\,e^3\,\left(28\,b^5\,d^5+210\,a\,b^4\,d^4\,e+420\,a^2\,b^3\,d^3\,e^2+280\,a^3\,b^2\,d^2\,e^3+60\,a^4\,b\,d\,e^4+3\,a^5\,e^5\right)\,x^{10}+\frac{1}{11}\,b^2\,e^4\,\left(70\,b^4\,d^4+336\,a\,b^3\,d^3\,e+420\,a^2\,b^2\,d^2\,e^2+160\,a^3\,b\,d\,e^3+15\,a^4\,e^4\right)\,x^{11}+\frac{1}{3}\,b^3\,e^5\,\left(14\,b^3\,d^3+42\,a\,b^2\,d^2\,e+30\,a^2\,b\,d\,e^2+5\,a^3\,e^3\right)\,x^{12}+\frac{1}{13}\,b^4\,e^6\,\left(28\,b^2\,d^2+48\,a\,b\,d\,e+15\,a^2\,e^2\right)\,x^{13}+\frac{1}{7}\,b^5\,e^7\,(4\,b\,d+3\,a\,e)\,x^{14}+\frac{1}{15}\,b^6\,e^8\,x^{15}$$

Problem 1482: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x)^7\,\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^3\,dx$$

Optimal (type 1, 173 leaves, 3 steps):

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

Result (type 1, 684 leaves):

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

Problem 1483: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^6 \left(a^2+2 a b x+b^2 x^2\right)^3 \, dx$$

Optimal (type 1, 171 leaves, 3 steps):

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

Result (type 1, 573 leaves):

$$a^6 d^6 x + 3 a^5 d^5 (b d + a e) x^2 + a^4 d^4 (5 b^2 d^2 + 12 a b d e + 5 a^2 e^2) x^3 +$$
$$\frac{5}{2} a^3 d^3 (2 b^3 d^3 + 9 a b^2 d^2 e + 9 a^2 b d e^2 + 2 a^3 e^3) x^4 +$$
$$3 a^2 d^2 (b^4 d^4 + 8 a b^3 d^3 e + 15 a^2 b^2 d^2 e^2 + 8 a^3 b d e^3 + a^4 e^4) x^5 +$$
$$a d (b^5 d^5 + 15 a b^4 d^4 e + 50 a^2 b^3 d^3 e^2 + 50 a^3 b^2 d^2 e^3 + 15 a^4 b d e^4 + a^5 e^5) x^6 +$$
$$\frac{1}{7} (b^6 d^6 + 36 a b^5 d^5 e + 225 a^2 b^4 d^4 e^2 + 400 a^3 b^3 d^3 e^3 + 225 a^4 b^2 d^2 e^4 + 36 a^5 b d e^5 + a^6 e^6) x^7 +$$
$$\frac{3}{4} b e (b^5 d^5 + 15 a b^4 d^4 e + 50 a^2 b^3 d^3 e^2 + 50 a^3 b^2 d^2 e^3 + 15 a^4 b d e^4 + a^5 e^5) x^8 +$$
$$\frac{5}{3} b^2 e^2 (b^4 d^4 + 8 a b^3 d^3 e + 15 a^2 b^2 d^2 e^2 + 8 a^3 b d e^3 + a^4 e^4) x^9 +$$
$$b^3 e^3 (2 b^3 d^3 + 9 a b^2 d^2 e + 9 a^2 b d e^2 + 2 a^3 e^3) x^{10} +$$
$$\frac{3}{11} b^4 e^4 (5 b^2 d^2 + 12 a b d e + 5 a^2 e^2) x^{11} + \frac{1}{2} b^5 e^5 (b d + a e) x^{12} + \frac{1}{13} b^6 e^6 x^{13}$$

Problem 1484: Result more than twice size of optimal antiderivative.

$$\int (d + e x)^5 (a^2 + 2 a b x + b^2 x^2)^3 \, dx$$

Optimal (type 1, 143 leaves, 3 steps):

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

Result (type 1, 501 leaves):

$$a^6 d^5 x + \frac{1}{2} a^5 d^4 (6 b d + 5 a e) x^2 + \frac{5}{3} a^4 d^3 (3 b^2 d^2 + 6 a b d e + 2 a^2 e^2) x^3 +$$
$$\frac{5}{4} a^3 d^2 (4 b^3 d^3 + 15 a b^2 d^2 e + 12 a^2 b d e^2 + 2 a^3 e^3) x^4 +$$
$$a^2 d (3 b^4 d^4 + 20 a b^3 d^3 e + 30 a^2 b^2 d^2 e^2 + 12 a^3 b d e^3 + a^4 e^4) x^5 +$$
$$\frac{1}{6} a (6 b^5 d^5 + 75 a b^4 d^4 e + 200 a^2 b^3 d^3 e^2 + 150 a^3 b^2 d^2 e^3 + 30 a^4 b d e^4 + a^5 e^5) x^6 +$$
$$\frac{1}{7} b (b^5 d^5 + 30 a b^4 d^4 e + 150 a^2 b^3 d^3 e^2 + 200 a^3 b^2 d^2 e^3 + 75 a^4 b d e^4 + 6 a^5 e^5) x^7 +$$
$$\frac{5}{8} b^2 e (b^4 d^4 + 12 a b^3 d^3 e + 30 a^2 b^2 d^2 e^2 + 20 a^3 b d e^3 + 3 a^4 e^4) x^8 +$$
$$\frac{5}{9} b^3 e^2 (2 b^3 d^3 + 12 a b^2 d^2 e + 15 a^2 b d e^2 + 4 a^3 e^3) x^9 +$$
$$\frac{1}{2} b^4 e^3 (2 b^2 d^2 + 6 a b d e + 3 a^2 e^2) x^{10} + \frac{1}{11} b^5 e^4 (5 b d + 6 a e) x^{11} + \frac{1}{12} b^6 e^5 x^{12}$$

Problem 1485: Result more than twice size of optimal antiderivative.

$$\int (d + e x)^4 (a^2 + 2 a b x + b^2 x^2)^3 \, dx$$

Optimal (type 1, 119 leaves, 3 steps):

$$\frac{(b d-a e)^4 (a+b x)^7}{7 b^5}+\frac{e (b d-a e)^3 (a+b x)^8}{2 b^5}+\frac{2 e^2 (b d-a e)^2 (a+b x)^9}{3 b^5}+\frac{2 e^3 (b d-a e) (a+b x)^{10}}{5 b^5}+\frac{e^4 (a+b x)^{11}}{11 b^5}$$

Result (type 1, 398 leaves):

$$a^6 d^4 x+a^5 d^3 (3 b d+2 a e) x^2+a^4 d^2 \left(5 b^2 d^2+8 a b d e+2 a^2 e^2\right) x^3+a^3 d \left(5 b^3 d^3+15 a b^2 d^2 e+9 a^2 b d e^2+a^3 e^3\right) x^4+\frac{1}{5} a^2 \left(15 b^4 d^4+80 a b^3 d^3 e+90 a^2 b^2 d^2 e^2+24 a^3 b d e^3+a^4 e^4\right) x^5+a b \left(b^4 d^4+10 a b^3 d^3 e+20 a^2 b^2 d^2 e^2+10 a^3 b d e^3+a^4 e^4\right) x^6+\frac{1}{7} b^2 \left(b^4 d^4+24 a b^3 d^3 e+90 a^2 b^2 d^2 e^2+80 a^3 b d e^3+15 a^4 e^4\right) x^7+\frac{1}{2} b^3 e \left(b^3 d^3+9 a b^2 d^2 e+15 a^2 b d e^2+5 a^3 e^3\right) x^8+\frac{1}{3} b^4 e^2 \left(2 b^2 d^2+8 a b d e+5 a^2 e^2\right) x^9+\frac{1}{5} b^5 e^3 (2 b d+3 a e) x^{10}+\frac{1}{11} b^6 e^4 x^{11}$$

Problem 1486: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 92 leaves, 3 steps):

$$\frac{(b d-a e)^3 (a+b x)^7}{7 b^4}+\frac{3 e (b d-a e)^2 (a+b x)^8}{8 b^4}+\frac{e^2 (b d-a e) (a+b x)^9}{3 b^4}+\frac{e^3 (a+b x)^{10}}{10 b^4}$$

Result (type 1, 276 leaves):

$$\frac{1}{840} x \left(210 a^6 \left(4 d^3+6 d^2 e x+4 d e^2 x^2+e^3 x^3\right)+252 a^5 b x \left(10 d^3+20 d^2 e x+15 d e^2 x^2+4 e^3 x^3\right)+210 a^4 b^2 x^2 \left(20 d^3+45 d^2 e x+36 d e^2 x^2+10 e^3 x^3\right)+120 a^3 b^3 x^3 \left(35 d^3+84 d^2 e x+70 d e^2 x^2+20 e^3 x^3\right)+45 a^2 b^4 x^4 \left(56 d^3+140 d^2 e x+120 d e^2 x^2+35 e^3 x^3\right)+10 a b^5 x^5 \left(84 d^3+216 d^2 e x+189 d e^2 x^2+56 e^3 x^3\right)+b^6 x^6 \left(120 d^3+315 d^2 e x+280 d e^2 x^2+84 e^3 x^3\right)\right)$$

Problem 1487: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 65 leaves, 3 steps):

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

Result (type 1, 199 leaves):

$$\frac{1}{252} x \left(84 a^6 \left(3 d^2 + 3 d e x + e^2 x^2\right) + 126 a^5 b x \left(6 d^2 + 8 d e x + 3 e^2 x^2\right) + 126 a^4 b^2 x^2 \left(10 d^2 + 15 d e x + 6 e^2 x^2\right) + 84 a^3 b^3 x^3 \left(15 d^2 + 24 d e x + 10 e^2 x^2\right) + 36 a^2 b^4 x^4 \left(21 d^2 + 35 d e x + 15 e^2 x^2\right) + 9 a b^5 x^5 \left(28 d^2 + 48 d e x + 21 e^2 x^2\right) + b^6 x^6 \left(36 d^2 + 63 d e x + 28 e^2 x^2\right)\right)$$

Problem 1488: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 38 leaves, 3 steps):

$$\frac{(b d - a e) (a + b x)^7}{7 b^2} + \frac{e (a + b x)^8}{8 b^2}$$

Result (type 1, 122 leaves):

$$\frac{1}{56} x \left(28 a^6 (2 d + e x) + 56 a^5 b x (3 d + 2 e x) + 70 a^4 b^2 x^2 (4 d + 3 e x) + 56 a^3 b^3 x^3 (5 d + 4 e x) + 28 a^2 b^4 x^4 (6 d + 5 e x) + 8 a b^5 x^5 (7 d + 6 e x) + b^6 x^6 (8 d + 7 e x)\right)$$

Problem 1497: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 28 leaves, 2 steps):

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

Result (type 1, 271 leaves):

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

Problem 1498: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a^2 + 2 a b x + b^2 x^2\right)^3}{(d + e x)^9} \, dx$$

Optimal (type 1, 58 leaves, 3 steps):

$$\frac{(a + b x)^7}{8 (b d - a e) (d + e x)^8} + \frac{b (a + b x)^7}{56 (b d - a e)^2 (d + e x)^7}$$

Result (type 1, 277 leaves):

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

Problem 1499: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 89 leaves, 4 steps):

$$\frac{(a+b x)^7}{9 (b d-a e) (d+e x)^9}+\frac{b (a+b x)^7}{36 (b d-a e)^2 (d+e x)^8}+\frac{b^2 (a+b x)^7}{252 (b d-a e)^3 (d+e x)^7}$$

Result (type 1, 277 leaves):

$$-\frac{1}{252 e^7 (d+e x)^9}\left(28 a^6 e^6+21 a^5 b e^5 (d+9 e x)+15 a^4 b^2 e^4 \left(d^2+9 d e x+36 e^2 x^2\right)+10 a^3 b^3 e^3 \left(d^3+9 d^2 e x+36 d e^2 x^2+84 e^3 x^3\right)+6 a^2 b^4 e^2 \left(d^4+9 d^3 e x+36 d^2 e^2 x^2+84 d e^3 x^3+126 e^4 x^4\right)+3 a b^5 e \left(d^5+9 d^4 e x+36 d^3 e^2 x^2+84 d^2 e^3 x^3+126 d e^4 x^4+126 e^5 x^5\right)+b^6 \left(d^6+9 d^5 e x+36 d^4 e^2 x^2+84 d^3 e^3 x^3+126 d^2 e^4 x^4+126 d e^5 x^5+84 e^6 x^6\right)\right)$$

Problem 1500: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a^2+2 a b x+b^2 x^2\right)^3}{(d+e x)^{11}}\,dx$$

Optimal (type 1, 120 leaves, 5 steps):

$$\frac{(a+b x)^7}{10 (b d-a e) (d+e x)^{10}}+\frac{b (a+b x)^7}{30 (b d-a e)^2 (d+e x)^9}+\frac{b^2 (a+b x)^7}{120 (b d-a e)^3 (d+e x)^8}+\frac{b^3 (a+b x)^7}{840 (b d-a e)^4 (d+e x)^7}$$

Result (type 1, 277 leaves):

$$-\frac{1}{840 e^7 (d+e x)^{10}}\left(84 a^6 e^6+56 a^5 b e^5 (d+10 e x)+35 a^4 b^2 e^4 \left(d^2+10 d e x+45 e^2 x^2\right)+20 a^3 b^3 e^3 \left(d^3+10 d^2 e x+45 d e^2 x^2+120 e^3 x^3\right)+10 a^2 b^4 e^2 \left(d^4+10 d^3 e x+45 d^2 e^2 x^2+120 d e^3 x^3+210 e^4 x^4\right)+4 a b^5 e \left(d^5+10 d^4 e x+45 d^3 e^2 x^2+120 d^2 e^3 x^3+210 d e^4 x^4+252 e^5 x^5\right)+b^6 \left(d^6+10 d^5 e x+45 d^4 e^2 x^2+120 d^3 e^3 x^3+210 d^2 e^4 x^4+252 d e^5 x^5+210 e^6 x^6\right)\right)$$

Problem 1526: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 3, 389 leaves):

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

Problem 1529: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 28 leaves, 2 steps):

$$-\frac{(d+e x)^5}{5 (b d-a e) (a+b x)^5}$$

Result (type 1, 140 leaves):

$$-\frac{1}{5 b^5 (a+b x)^5}\Big(a^4 e^4+a^3 b e^3 (d+5 e x)+a^2 b^2 e^2 \left(d^2+5 d e x+10 e^2 x^2\right)+a b^3 e \left(d^3+5 d^2 e x+10 d e^2 x^2+10 e^3 x^3\right)+b^4 \left(d^4+5 d^3 e x+10 d^2 e^2 x^2+10 d e^3 x^3+5 e^4 x^4\right)\Big)$$

Problem 1537: Result more than twice size of optimal antiderivative.

$$\int (d+e x) \left(9+12 x+4 x^2\right)^3 \, dx$$

Optimal (type 1, 31 leaves, 3 steps):

$$\frac{1}{28} (2 d-3 e) (3+2 x)^7+\frac{1}{32} e (3+2 x)^8$$

Result (type 1, 81 leaves):

$$729\,d\,x+\frac{729}{2}\,(4\,d+e)\,x^2+324\,(5\,d+3\,e)\,x^3+135\,(8\,d+9\,e)\,x^4+432\,(d+2\,e)\,x^5+24\,(4\,d+15\,e)\,x^6+\frac{64}{7}\,(d+9\,e)\,x^7+8\,e\,x^8$$

Problem 1564: Result more than twice size of optimal antiderivative.

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

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

$$\frac{(a+b\,x)^3\,\sqrt{a^2+2\,a\,b\,x+b^2\,x^2}}{4\,(b\,d-a\,e)\,(d+e\,x)^4}$$

Result (type 2, 109 leaves):

$$-\left(\left(\sqrt{(a+b\,x)^2}\,\left(a^3\,e^3+a^2\,b\,e^2\,(d+4\,e\,x)+a\,b^2\,e\,\left(d^2+4\,d\,e\,x+6\,e^2\,x^2\right)+b^3\,\left(d^3+4\,d^2\,e\,x+6\,d\,e^2\,x^2+4\,e^3\,x^3\right)\right)\right)\Big/\left(4\,e^4\,(a+b\,x)\,(d+e\,x)^4\right)\right)$$

Problem 1581: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^{5/2}}{(d+e\,x)^7}\,dx$$

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

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

Result (type 2, 218 leaves):

$$-\left(\left(\sqrt{(a+b\,x)^2}\,\left(a^5\,e^5+a^4\,b\,e^4\,(d+6\,e\,x)+a^3\,b^2\,e^3\,\left(d^2+6\,d\,e\,x+15\,e^2\,x^2\right)+a^2\,b^3\,e^2\left(d^3+6\,d^2\,e\,x+15\,d\,e^2\,x^2+20\,e^3\,x^3\right)+a\,b^4\,e\,\left(d^4+6\,d^3\,e\,x+15\,d^2\,e^2\,x^2+20\,d\,e^3\,x^3+15\,e^4\,x^4\right)+b^5\,\left(d^5+6\,d^4\,e\,x+15\,d^3\,e^2\,x^2+20\,d^2\,e^3\,x^3+15\,d\,e^4\,x^4+6\,e^5\,x^5\right)\right)\right)\Big/\left(6\,e^6\,(a+b\,x)\,(d+e\,x)^6\right)\right)$$

Problem 1582: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^{5/2}}{(d+e\,x)^8}\,dx$$

Optimal (type 2, 98 leaves, 3 steps):

$$\frac{(a+b x)^5 \sqrt{a^2+2 a b x+b^2 x^2}}{7 (b d-a e) (d+e x)^7}+\frac{b (a+b x)^5 \sqrt{a^2+2 a b x+b^2 x^2}}{42 (b d-a e)^2 (d+e x)^6}$$

Result (type 2, 223 leaves):

$$-\left(\left(\sqrt{(a+b x)^2} \left(6 a^5 e^5+5 a^4 b e^4 (d+7 e x)+4 a^3 b^2 e^3 \left(d^2+7 d e x+21 e^2 x^2\right)+3 a^2 b^3 e^2 \left(d^3+7 d^2 e x+21 d e^2 x^2+35 e^3 x^3\right)+2 a b^4 e \left(d^4+7 d^3 e x+21 d^2 e^2 x^2+35 d e^3 x^3+35 e^4 x^4\right)+b^5 \left(d^5+7 d^4 e x+21 d^3 e^2 x^2+35 d^2 e^3 x^3+35 d e^4 x^4+21 e^5 x^5\right)\right)\right)\Big/\left(42 e^6 (a+b x) (d+e x)^7\right)\right)$$

Problem 1607: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{(d+e x)^4}{4 (b d-a e) (a+b x)^3 \sqrt{a^2+2 a b x+b^2 x^2}}$$

Result (type 2, 106 leaves):

$$\left(-a^3 e^3-a^2 b e^2 (d+4 e x)-a b^2 e \left(d^2+4 d e x+6 e^2 x^2\right)-b^3 \left(d^3+4 d^2 e x+6 d e^2 x^2+4 e^3 x^3\right)\right)\Big/\left(4 b^4 (a+b x)^3 \sqrt{(a+b x)^2}\right)$$

Problem 1731: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 206 leaves, 3 steps):

$$\frac{(b d-a e)^6 (d+e x)^{1+m}}{e^7 (1+m)}-\frac{6 b (b d-a e)^5 (d+e x)^{2+m}}{e^7 (2+m)}+\frac{15 b^2 (b d-a e)^4 (d+e x)^{3+m}}{e^7 (3+m)}-\frac{20 b^3 (b d-a e)^3 (d+e x)^{4+m}}{e^7 (4+m)}+\frac{15 b^4 (b d-a e)^2 (d+e x)^{5+m}}{e^7 (5+m)}-\frac{6 b^5 (b d-a e) (d+e x)^{6+m}}{e^7 (6+m)}+\frac{b^6 (d+e x)^{7+m}}{e^7 (7+m)}$$

Result (type 3, 646 leaves):

$$\frac{1}{e^7 (1+m) (2+m) (3+m) (4+m) (5+m) (6+m) (7+m)}$$
$$(d+e x)^{1+m} \left(a^6 e^6 \left(5040+8028 m+5104 m^2+1665 m^3+295 m^4+27 m^5+m^6\right)-\right.$$
$$6 a^5 b e^5 \left(2520+2754 m+1175 m^2+245 m^3+25 m^4+m^5\right) (d-e (1+m) x)+$$
$$15 a^4 b^2 e^4 \left(840+638 m+179 m^2+22 m^3+m^4\right) \left(2 d^2-2 d e (1+m) x+e^2 \left(2+3 m+m^2\right) x^2\right)+$$
$$20 a^3 b^3 e^3 \left(210+107 m+18 m^2+m^3\right)$$
$$\left(-6 d^3+6 d^2 e (1+m) x-3 d e^2 \left(2+3 m+m^2\right) x^2+e^3 \left(6+11 m+6 m^2+m^3\right) x^3\right)+$$
$$15 a^2 b^4 e^2 \left(42+13 m+m^2\right) \left(24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 \left(2+3 m+m^2\right) x^2-\right.$$
$$\left.4 d e^3 \left(6+11 m+6 m^2+m^3\right) x^3+e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4\right)+6 a b^5 e (7+m)$$
$$\left(-120 d^5+120 d^4 e (1+m) x-60 d^3 e^2 \left(2+3 m+m^2\right) x^2+20 d^2 e^3 \left(6+11 m+6 m^2+m^3\right) x^3-\right.$$
$$\left.5 d e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4+e^5 \left(120+274 m+225 m^2+85 m^3+15 m^4+m^5\right) x^5\right)+$$
$$b^6 \left(720 d^6-720 d^5 e (1+m) x+360 d^4 e^2 \left(2+3 m+m^2\right) x^2-120 d^3 e^3 \left(6+11 m+6 m^2+m^3\right) x^3+\right.$$
$$30 d^2 e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4-6 d e^5 \left(120+274 m+225 m^2+85 m^3+15 m^4+m^5\right) x^5+$$
$$\left.\left.e^6 \left(720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6\right) x^6\right)\right)$$

Problem 1732: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^m \left(a^2+2 a b x+b^2 x^2\right)^2 \, dx$$

Optimal (type 3, 142 leaves, 3 steps):

$$\frac{(b d-a e)^4 (d+e x)^{1+m}}{e^5 (1+m)}-\frac{4 b (b d-a e)^3 (d+e x)^{2+m}}{e^5 (2+m)}+$$
$$\frac{6 b^2 (b d-a e)^2 (d+e x)^{3+m}}{e^5 (3+m)}-\frac{4 b^3 (b d-a e) (d+e x)^{4+m}}{e^5 (4+m)}+\frac{b^4 (d+e x)^{5+m}}{e^5 (5+m)}$$

Result (type 3, 292 leaves):

$$\frac{1}{e^5 (1+m) (2+m) (3+m) (4+m) (5+m)}$$
$$(d+e x)^{1+m} \left(a^4 e^4 \left(120+154 m+71 m^2+14 m^3+m^4\right)-4 a^3 b e^3 \left(60+47 m+12 m^2+m^3\right) (d-e (1+m) x)+\right.$$
$$6 a^2 b^2 e^2 \left(20+9 m+m^2\right) \left(2 d^2-2 d e (1+m) x+e^2 \left(2+3 m+m^2\right) x^2\right)+$$
$$4 a b^3 e (5+m) \left(-6 d^3+6 d^2 e (1+m) x-3 d e^2 \left(2+3 m+m^2\right) x^2+e^3 \left(6+11 m+6 m^2+m^3\right) x^3\right)+$$
$$b^4 \left(24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 \left(2+3 m+m^2\right) x^2-\right.$$
$$\left.\left.4 d e^3 \left(6+11 m+6 m^2+m^3\right) x^3+e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4\right)\right)$$

Problem 1734: Unable to integrate problem.

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

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

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

Result (type 8, 28 leaves):

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

Problem 1735: Unable to integrate problem.

$$\int \frac{(d+e\,x)^m}{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^2}\,dx$$

Optimal (type 5, 53 leaves, 2 steps):

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

Result (type 8, 28 leaves):

$$\int \frac{(d+e\,x)^m}{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^2}\,dx$$

Problem 1736: Unable to integrate problem.

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

Optimal (type 5, 53 leaves, 2 steps):

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

Result (type 8, 28 leaves):

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

Problem 1741: Unable to integrate problem.

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

Optimal (type 5, 79 leaves, 2 steps):

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

Result (type 8, 30 leaves):

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

Problem 1742: Unable to integrate problem.

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

Optimal (type 5, 79 leaves, 2 steps):

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

Result (type 8, 30 leaves):

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

Problem 1749: Unable to integrate problem.

$$\int \frac{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^p}{(d+e\,x)^2}\,dx$$

Optimal (type 5, 72 leaves, 2 steps):

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

Result (type 8, 28 leaves):

$$\int \frac{\left(a^2+2\,a\,b\,x+b^2\,x^2\right)^p}{(d+e\,x)^2}\,dx$$

Problem 1750: Unable to integrate problem.

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

Optimal (type 5, 74 leaves, 2 steps):

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

Result (type 8, 28 leaves):

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

Problem 1751: Result unnecessarily involves higher level functions and more

than twice size of optimal antiderivative.

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

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

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

Result (type 6, 202 leaves):

$$\frac{1}{3\,e}d\,\left(\left((a+b\,x)^2\right)^p\,\sqrt{d+e\,x}\,\left(\left(9\,a\,e^2\,x^2\,\text{AppellF1}\left[2,\,-2\,p,\,-\frac{1}{2},\,3,\,-\frac{b\,x}{a},\,-\frac{e\,x}{d}\right]\right)\Big/\left(6\,a\,d\,\text{AppellF1}\left[2,\,-2\,p,\,-\frac{1}{2},\,3,\,-\frac{b\,x}{a},\,-\frac{e\,x}{d}\right]+4\,b\,d\,p\,x\;\text{AppellF1}\left[3,\,1-2\,p,\,-\frac{1}{2},\,4,\,-\frac{b\,x}{a},\,-\frac{e\,x}{d}\right]+a\,e\,x\,\text{AppellF1}\left[3,\,-2\,p,\,\frac{1}{2},\,4,\,-\frac{b\,x}{a},\,-\frac{e\,x}{d}\right]\right)+2\,\left(\frac{e\,(a+b\,x)}{-b\,d+a\,e}\right)^{-2\,p}\,(d+e\,x)\,\text{Hypergeometric2F1}\left[\frac{3}{2},\,-2\,p,\,\frac{5}{2},\,\frac{b\,(d+e\,x)}{b\,d-a\,e}\right]\right)\right)$$

Problem 1759: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 38 leaves, 3 steps):

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

Result (type 1, 84 leaves):

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

Problem 1769: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 65 leaves, 3 steps):

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

Result (type 1, 189 leaves):

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

Problem 1770: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^2 \left(a c+(b c+a d) x+b d x^2\right)^2 dx$$

Optimal (type 1, 65 leaves, 3 steps):

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

Result (type 1, 148 leaves):

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

Problem 1783: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 92 leaves, 3 steps):

$$\frac{(b c-a d)^3 (a+b x)^7}{7 b^4}+\frac{3 d (b c-a d)^2 (a+b x)^8}{8 b^4}+\frac{d^2 (b c-a d) (a+b x)^9}{3 b^4}+\frac{d^3 (a+b x)^{10}}{10 b^4}$$

Result (type 1, 276 leaves):

$$\frac{1}{840} x \left(210 a^6 \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right)+252 a^5 b x \left(10 c^3+20 c^2 d x+15 c d^2 x^2+4 d^3 x^3\right)+210 a^4 b^2 x^2 \left(20 c^3+45 c^2 d x+36 c d^2 x^2+10 d^3 x^3\right)+120 a^3 b^3 x^3 \left(35 c^3+84 c^2 d x+70 c d^2 x^2+20 d^3 x^3\right)+45 a^2 b^4 x^4 \left(56 c^3+140 c^2 d x+120 c d^2 x^2+35 d^3 x^3\right)+10 a b^5 x^5 \left(84 c^3+216 c^2 d x+189 c d^2 x^2+56 d^3 x^3\right)+b^6 x^6 \left(120 c^3+315 c^2 d x+280 c d^2 x^2+84 d^3 x^3\right)\right)$$

Problem 1784: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 92 leaves, 3 steps):

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

Result (type 1, 235 leaves):

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

Problem 1785: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 92 leaves, 3 steps):

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

Result (type 1, 217 leaves):

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

Problem 1794: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 28 leaves, 2 steps):

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

Result (type 1, 91 leaves):

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

Problem 1828: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^4 \left(a d e+\left(c d^2+a e^2\right) x+c d e x^2\right) \, dx$$

Optimal (type 1, 39 leaves, 3 steps):

$$\frac{1}{6}\left(a-\frac{c\,d^2}{e^2}\right)(d+e\,x)^6+\frac{c\,d\,(d+e\,x)^7}{7\,e^2}$$

Result (type 1, 117 leaves):

$$\frac{1}{42}\,x\,\left(7\,a\,e\,\left(6\,d^5+15\,d^4\,e\,x+20\,d^3\,e^2\,x^2+15\,d^2\,e^3\,x^3+6\,d\,e^4\,x^4+e^5\,x^5\right)+c\,d\,x\,\left(21\,d^5+70\,d^4\,e\,x+105\,d^3\,e^2\,x^2+84\,d^2\,e^3\,x^3+35\,d\,e^4\,x^4+6\,e^5\,x^5\right)\right)$$

Problem 1829: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x)^3\,\left(a\,d\,e+\left(c\,d^2+a\,e^2\right)x+c\,d\,e\,x^2\right)\,dx$$

Optimal (type 1, 39 leaves, 3 steps):

$$\frac{1}{5}\left(a-\frac{c\,d^2}{e^2}\right)(d+e\,x)^5+\frac{c\,d\,(d+e\,x)^6}{6\,e^2}$$

Result (type 1, 95 leaves):

$$\frac{1}{30}\,x\,\left(6\,a\,e\,\left(5\,d^4+10\,d^3\,e\,x+10\,d^2\,e^2\,x^2+5\,d\,e^3\,x^3+e^4\,x^4\right)+c\,d\,x\,\left(15\,d^4+40\,d^3\,e\,x+45\,d^2\,e^2\,x^2+24\,d\,e^3\,x^3+5\,e^4\,x^4\right)\right)$$

Problem 1839: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x)^2\,\left(a\,d\,e+\left(c\,d^2+a\,e^2\right)x+c\,d\,e\,x^2\right)^2\,dx$$

Optimal (type 1, 77 leaves, 3 steps):

$$\frac{\left(c\,d^2-a\,e^2\right)^2(d+e\,x)^5}{5\,e^3}-\frac{c\,d\,\left(c\,d^2-a\,e^2\right)(d+e\,x)^6}{3\,e^3}+\frac{c^2\,d^2\,(d+e\,x)^7}{7\,e^3}$$

Result (type 1, 160 leaves):

$$\frac{1}{15}\,a\,c\,d\,e\,x^2\,\left(15\,d^4+40\,d^3\,e\,x+45\,d^2\,e^2\,x^2+24\,d\,e^3\,x^3+5\,e^4\,x^4\right)+\frac{1}{105}\,c^2\,d^2\,x^3\,\left(35\,d^4+105\,d^3\,e\,x+126\,d^2\,e^2\,x^2+70\,d\,e^3\,x^3+15\,e^4\,x^4\right)+a^2\,\left(d^4\,e^2\,x+2\,d^3\,e^3\,x^2+2\,d^2\,e^4\,x^3+d\,e^5\,x^4+\frac{e^6\,x^5}{5}\right)$$

Problem 1851: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x)^2\,\left(a\,d\,e+\left(c\,d^2+a\,e^2\right)x+c\,d\,e\,x^2\right)^3\,dx$$

Optimal (type 1, 111 leaves, 3 steps):

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

Result (type 1, 255 leaves):

$$\frac{1}{504} x \left(84 a^3 e^3 \left(6 d^5+15 d^4 e x+20 d^3 e^2 x^2+15 d^2 e^3 x^3+6 d e^4 x^4+e^5 x^5\right)+36 a^2 c d e^2 x \left(21 d^5+70 d^4 e x+105 d^3 e^2 x^2+84 d^2 e^3 x^3+35 d e^4 x^4+6 e^5 x^5\right)+9 a c^2 d^2 e x^2 \left(56 d^5+210 d^4 e x+336 d^3 e^2 x^2+280 d^2 e^3 x^3+120 d e^4 x^4+21 e^5 x^5\right)+c^3 d^3 x^3 \left(126 d^5+504 d^4 e x+840 d^3 e^2 x^2+720 d^2 e^3 x^3+315 d e^4 x^4+56 e^5 x^5\right)\right)$$

Problem 1861: Result more than twice size of optimal antiderivative.

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

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

$$\frac{(a e+c d x)^4}{4 \left(c d^2-a e^2\right) (d+e x)^4}$$

Result (type 1, 100 leaves):

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

Problem 1974: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 1485 leaves, 5 steps):

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

$$\left(3\left(c\,d^2-a\,e^2\right)\sqrt{\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)^2}\sqrt{\left(a\,e^2+c\,d\,(d+2\,e\,x)\right)^2}\right)\Big/\left(2\times 2^{1/3}\,c^{5/3}\,d^{5/3}\,e^{2/3}\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\right)-$$

$$\left(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\left(c\,d^2-a\,e^2\right)^{5/3}\sqrt{\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)^2}\left(\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\sqrt{\left(\left(\left(c\,d^2-a\,e^2\right)^{4/3}-2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left(c\,d^2-a\,e^2\right)^{2/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,d^{2/3}\,e^{2/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)^2\right)}\;\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\left(\left(1-\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(4\times 2^{1/3}\,c^{5/3}\,d^{5/3}\,e^{2/3}\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)\sqrt{\left(\left(c\,d^2-a\,e^2\right)^{2/3}\left(\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)^2}\sqrt{\left(a\,e^2+c\,d\,(d+2\,e\,x)\right)^2}\right)+$$

$$\left(3^{3/4}\left(c\,d^2-a\,e^2\right)^{5/3}\sqrt{\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)^2}\left(\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\sqrt{\left(\left(\left(c\,d^2-a\,e^2\right)^{4/3}-2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left(c\,d^2-a\,e^2\right)^{2/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,d^{2/3}\,e^{2/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)^2\right)}\;\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\left(\left(1-\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(2^{5/6}\,c^{5/3}\,d^{5/3}\,e^{2/3}\left(c\,d^2+a\,e^2+2\,c\,d\,e\,x\right)\sqrt{\left(\left(c\,d^2-a\,e^2\right)^{2/3}\left(\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)\left(c\,d^2-a\,e^2\right)^{2/3}+2^{2/3}\,c^{1/3}\,d^{1/3}\,e^{1/3}\left((a\,e+c\,d\,x)\,(d+e\,x)\right)^{1/3}\right)^2}\sqrt{\left(a\,e^2+c\,d\,(d+2\,e\,x)\right)^2}\right)$$

Result (type 5, 120 leaves):

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

Problem 1975: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 1432 leaves, 4 steps):

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

Result (type 5, 90 leaves) :

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

Problem 2083: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 566 leaves, 5 steps):

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

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

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

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

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

$$\left(4\,c\,d\,e\,\sqrt{d\,(a\,e+c\,d\,x)}\,\sqrt{a\,d\,e+\left(c\,d^2+a\,e^2\right)x+c\,d\,e\,x^2}\right.$$

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

Result (type 5, 124 leaves):

$$\left(3\,(d+e\,x)^{2/3}\right.$$

$$\left.\left(e\,(a\,e+c\,d\,x)+\left(c\,d^2-a\,e^2\right)\sqrt{\frac{e\,(a\,e+c\,d\,x)}{-c\,d^2+a\,e^2}}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{c\,d\,(d+e\,x)}{c\,d^2-a\,e^2}\right]\right)\right)\Big/$$

$$\left(2\,c\,d\,e\,\sqrt{(a\,e+c\,d\,x)\,(d+e\,x)}\right)$$

Problem 2089: Result more than twice size of optimal antiderivative.

$$\int \frac{(d+e x)^m}{\left(a d e+\left(c d^2+a e^2\right) x+c d e x^2\right)^3} \, dx$$

Optimal (type 5, 64 leaves, 2 steps):

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

Result (type 5, 368 leaves):

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

Problem 2090: Result more than twice size of optimal antiderivative.

$$\int \frac{(d+e x)^m}{\left(a d e+\left(c d^2+a e^2\right) x+c d e x^2\right)^4} \, dx$$

Optimal (type 5, 65 leaves, 2 steps):

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

Result (type 5, 504 leaves):

$$\frac{1}{\left(-c d^2+a e^2\right)^7} c^3 d^3 (d+e x)^m \left(-\frac{20 e^3}{m}+\frac{\left(-c d^2 e+a e^3\right)^3}{c^3 d^3 (-3+m) (d+e x)^3}-\frac{4 e^3 \left(c d^2-a e^2\right)^2}{c^2 d^2 (-2+m) (d+e x)^2}+\frac{10 e^3 \left(-c d^2+a e^2\right)}{c d (-1+m) (d+e x)}+\right.$$

$$\left(10 e^2 \left(-c d^2+a e^2\right) \left(\frac{c d (d+e x)}{e (a e+c d x)}\right)^{-m} \text{Hypergeometric2F1}\left[1-m,-m,2-m,\frac{-c d^2+a e^2}{e (a e+c d x)}\right]\right) \Big/$$

$$\left((-1+m) (a e+c d x)\right)+\left(4 e \left(c d^2-a e^2\right)^2 \left(\frac{c d (d+e x)}{e (a e+c d x)}\right)^{-m}\right.$$

$$\left.\text{Hypergeometric2F1}\left[2-m,-m,3-m,\frac{-c d^2+a e^2}{e (a e+c d x)}\right]\right) \Big/ \left((-2+m) (a e+c d x)^2\right)-$$

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

$$\left.\left((-3+m) (a e+c d x)^3\right)+\frac{20 e^3 \left(\frac{c d (d+e x)}{e (a e+c d x)}\right)^{-m} \text{Hypergeometric2F1}\left[-m,-m,1-m,\frac{-c d^2+a e^2}{e (a e+c d x)}\right]}{m}\right)$$

Problem 2092: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d+e x)^3 \left(a d e+\left(c d^2+a e^2\right) x+c d e x^2\right)^p \, dx$$

Optimal (type 5, 95 leaves, 3 steps):

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

Result (type 6, 533 leaves):

$$\frac{1}{4e} d\left((a e+c d x)(d+e x)\right)^p \left(\left(18 a d^2 e^3 x^2 \text{AppellF1}\left[2,-p,-p,3,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\Big/\left(3 a d e \text{AppellF1}\left[2,-p,-p,3,-\frac{c d x}{a e},-\frac{e x}{d}\right]+p x\left(c d^2 \text{AppellF1}\left[3,1-p,-p,4,-\frac{c d x}{a e},-\frac{e x}{d}\right]+a e^2 \text{AppellF1}\left[3,-p,1-p,4,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\right)+\left(16 a d e^4 x^3 \text{AppellF1}\left[3,-p,-p,4,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\Big/\left(4 a d e \text{AppellF1}\left[3,-p,-p,4,-\frac{c d x}{a e},-\frac{e x}{d}\right]+p x\left(c d^2 \text{AppellF1}\left[4,1-p,-p,5,-\frac{c d x}{a e},-\frac{e x}{d}\right]+a e^2 \text{AppellF1}\left[4,-p,1-p,5,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\right)+\left(5 a e^5 x^4 \text{AppellF1}\left[4,-p,-p,5,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\Big/\left(5 a d e \text{AppellF1}\left[4,-p,-p,5,-\frac{c d x}{a e},-\frac{e x}{d}\right]+p x\left(c d^2 \text{AppellF1}\left[5,1-p,-p,6,-\frac{c d x}{a e},-\frac{e x}{d}\right]+a e^2 \text{AppellF1}\left[5,-p,1-p,6,-\frac{c d x}{a e},-\frac{e x}{d}\right]\right)\right)+\frac{1}{1+p} 4 d^2\left(\frac{e(a e+c d x)}{-c d^2+a e^2}\right)^{-p}(d+e x) \text{Hypergeometric2F1}\left[-p,1+p,2+p,\frac{c d(d+e x)}{c d^2-a e^2}\right]\right)$$

Problem 2093: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d+e x)^2 \left(a d e+\left(c d^2+a e^2\right) x+c d e x^2\right)^p \, dx$$

Optimal (type 5, 95 leaves, 3 steps):

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

Result (type 6, 385 leaves):

$$\frac{1}{3e} d \left((a e + c d x) (d + e x)\right)^p \left(\left(9 a d e^3 x^2 \text{AppellF1}\left[2, -p, -p, 3, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right) \Big/ \left(3 a d e \text{AppellF1}\left[2, -p, -p, 3, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + p x \left(c d^2 \text{AppellF1}\left[3, 1-p, -p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + a e^2 \text{AppellF1}\left[3, -p, 1-p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right)\right) + \left(4 a e^4 x^3 \text{AppellF1}\left[3, -p, -p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right) \Big/ \left(4 a d e \text{AppellF1}\left[3, -p, -p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + c d^2 p x \text{AppellF1}\left[4, 1-p, -p, 5, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + a e^2 p x \text{AppellF1}\left[4, -p, 1-p, 5, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right) + \frac{1}{1+p} 3 d \left(\frac{e (a e + c d x)}{-c d^2 + a e^2}\right)^{-p} (d + e x) \text{Hypergeometric2F1}\left[-p, 1+p, 2+p, \frac{c d (d + e x)}{c d^2 - a e^2}\right]\right)$$

Problem 2094: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d + e x) \left(a d e + \left(c d^2 + a e^2\right) x + c d e x^2\right)^p \, dx$$

Optimal (type 5, 95 leaves, 2 steps):

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

Result (type 6, 237 leaves):

$$\frac{1}{e} d \left((a e + c d x) (d + e x)\right)^p \left(\left(3 a e^3 x^2 \text{AppellF1}\left[2, -p, -p, 3, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right) \Big/ \left(6 a d e \text{AppellF1}\left[2, -p, -p, 3, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + 2 p x \left(c d^2 \text{AppellF1}\left[3, 1-p, -p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right] + a e^2 \text{AppellF1}\left[3, -p, 1-p, 4, -\frac{c d x}{a e}, -\frac{e x}{d}\right]\right)\right) + \frac{1}{1+p} \left(\frac{e (a e + c d x)}{-c d^2 + a e^2}\right)^{-p} (d + e x) \text{Hypergeometric2F1}\left[-p, 1+p, 2+p, \frac{c d (d + e x)}{c d^2 - a e^2}\right]\right)$$

Problem 2103: Result unnecessarily involves higher level functions.

$$\int (d+e\,x)^{-4-2\,p}\,\left(a\,d\,e+\left(c\,d^2+a\,e^2\right)\,x+c\,d\,e\,x^2\right)^p\,dx$$

Optimal (type 3, 206 leaves, 3 steps):

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

Result (type 5, 101 leaves):

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

Problem 2202: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 169 leaves, 4 steps):

$$-\frac{(d+e\,x)^3\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{2\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^2}+\frac{3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(d+e\,x)\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{\left(b^2-4\,a\,c\right)^2\,\left(a+b\,x+c\,x^2\right)}-\frac{12\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\text{ArcTanh}\left[\frac{b+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right]}{\left(b^2-4\,a\,c\right)^{5/2}}$$

Result (type 3, 413 leaves):

$$\frac{1}{2}\left(\left(b^4 e^4 x+b^3 e^3 (a e-4 c d x)+2 b^2 c e^2 \left(3 c d^2 x-2 a e (d+e x)\right)+b c \left(-3 a^2 e^4+c^2 d^3 (d-4 e x)+6 a c d e^2 (d+2 e x)\right)+2 c^2 \left(c^2 d^4 x+a^2 e^3 (4 d+e x)-2 a c d^2 e (2 d+3 e x)\right)\right)\Big/\left(c^3 \left(-b^2+4 a c\right) (a+x (b+c x))^2\right)+\left(b^5 e^4+2 b^3 c e^2 \left(3 c d^2-4 a e^2\right)-2 b^4 c e^3 (2 d+e x)+2 b c^2 \left(11 a^2 e^4+3 c^2 d^3 (d-4 e x)+6 a c d e^2 (d-2 e x)\right)+4 b^2 c^2 e \left(-3 c d^2 (d-e x)+a e^2 (5 d+4 e x)\right)+4 c^3 \left(3 c^2 d^4 x+6 a c d^2 e^2 x-a^2 e^3 (16 d+5 e x)\right)\right)\Big/\left(c^3 \left(b^2-4 a c\right)^2 (a+x (b+c x))\right)+\frac{24 \left(c d^2+e (-b d+a e)\right)^2 \text{ArcTan}\left[\frac{b+2 c x}{\sqrt{-b^2+4 a c}}\right]}{\left(-b^2+4 a c\right)^{5/2}}\right)$$

Problem 2212: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 146 leaves, 5 steps):

$$\frac{x^5 (2 a+b x)}{3 \left(b^2-4 a c\right) \left(a+b x+c x^2\right)^3}-\frac{5 a x^3 (2 a+b x)}{3 \left(b^2-4 a c\right)^2 \left(a+b x+c x^2\right)^2}+\frac{10 a^2 x (2 a+b x)}{\left(b^2-4 a c\right)^3 \left(a+b x+c x^2\right)}+\frac{40 a^3 \text{ArcTanh}\left[\frac{b+2 c x}{\sqrt{b^2-4 a c}}\right]}{\left(b^2-4 a c\right)^{7/2}}$$

Result (type 3, 314 leaves):

$$\left(b^7-12 a b^5 c+48 a^2 b^3 c^2-59 a^3 b c^3-4 b^6 c x+33 a b^4 c^2 x-72 a^2 b^2 c^3 x+26 a^3 c^4 x\right)\Big/\left(3 c^5 \left(b^2-4 a c\right)^2 (a+x (b+c x))^2\right)+\left(-b^7+12 a b^5 c-48 a^2 b^3 c^2+74 a^3 b c^3+b^6 c x-12 a b^4 c^2 x+48 a^2 b^2 c^3 x-44 a^3 c^4 x\right)\Big/\left(c^4 \left(-b^2+4 a c\right)^3 (a+x (b+c x))\right)+\frac{b^6 x+a b^4 (b-6 c x)+a^3 c^2 (5 b-2 c x)+a^2 b^2 c (-5 b+9 c x)}{3 c^5 \left(-b^2+4 a c\right) (a+x (b+c x))^3}+\frac{40 a^3 \text{ArcTan}\left[\frac{b+2 c x}{\sqrt{-b^2+4 a c}}\right]}{\left(-b^2+4 a c\right)^{7/2}}$$

Problem 2214: Result more than twice size of optimal antiderivative.

$$\int \frac{(d+e x)^4}{\left(a+b x+c x^2\right)^4} \, dx$$

Optimal (type 3, 259 leaves, 5 steps):

$$-\frac{(b+2cx)(d+ex)^4}{3(b^2-4ac)(a+bx+cx^2)^3}+\frac{(d+ex)^3(5bcd-2b^2e-2ace+5c(2cd-be)x)}{3(b^2-4ac)^2(a+bx+cx^2)^2}-$$
$$\left(2\left(5c^2d^2+b^2e^2-ce(5bd-ae)\right)(d+ex)(bd-2ae+(2cd-be)x)\right)\Big/$$
$$\left((b^2-4ac)^3(a+bx+cx^2)\right)+\frac{1}{(b^2-4ac)^{7/2}}$$
$$8(cd^2-bde+ae^2)\left(5c^2d^2+b^2e^2-ce(5bd-ae)\right)\text{ArcTanh}\left[\frac{b+2cx}{\sqrt{b^2-4ac}}\right]$$

Result (type 3, 572 leaves):

$$\frac{1}{3}\Bigg(\left(6\left(5c^3d^4+b^2e^3(-bd+ae)+2c^2d^2e(-5bd+3ae)+ce^2(6b^2d^2-6abde+a^2e^2)\right)\right.$$
$$\left.(b+2cx)\right)\Big/\left(c(-b^2+4ac)^3(a+x(b+cx))\right)+$$
$$\left(b^4e^4x+b^3e^3(ae-4cdx)+2b^2ce^2\left(3cd^2x-2ae(d+ex)\right)+\right.$$
$$bc\left(-3a^2e^4+c^2d^3(d-4ex)+6acde^2(d+2ex)\right)+$$
$$\left.2c^2\left(c^2d^4x+a^2e^3(4d+ex)-2acd^2e(2d+3ex)\right)\right)\Big/\left(c^3(-b^2+4ac)(a+x(b+cx))^3\right)+$$
$$\left(b^5e^4-b^4ce^3(4d+ex)+bc^2\left(17a^2e^4+5c^2d^3(d-4ex)+6acde^2(d-2ex)\right)+\right.$$
$$b^3ce^2\left(-7ae^2+2cd(3d-ex)\right)+2b^2c^2e\left(ae^2(9d+5ex)+cd^2(-5d+6ex)\right)+$$
$$\left.2c^3\left(5c^2d^4x+6acd^2e^2x-a^2e^3(24d+7ex)\right)\right)\Big/$$
$$\left(c^3(b^2-4ac)^2(a+x(b+cx))^2\right)+\frac{1}{(-b^2+4ac)^{7/2}}$$
$$24\left(5c^3d^4+b^2e^3(-bd+ae)+2c^2d^2e(-5bd+3ae)+ce^2(6b^2d^2-6abde+a^2e^2)\right)$$
$$\text{ArcTan}\left[\frac{b+2cx}{\sqrt{-b^2+4ac}}\right]\Bigg)$$

Problem 2221: Result more than twice size of optimal antiderivative.

$$\int\frac{(d+ex)^5}{(a+bx+cx^2)^5}\,dx$$

Optimal (type 3, 388 leaves, 6 steps):

$$-\frac{(b+2cx)(d+ex)^5}{4(b^2-4ac)(a+bx+cx^2)^4}+\frac{(d+ex)^4(14bcd-5b^2e-8ace+14c(2cd-be)x)}{12(b^2-4ac)^2(a+bx+cx^2)^3}+$$
$$\left((d+ex)^3\left(63b^2cde+28ac^2de-10b^3e^2-10bc(7cd^2+3ae^2)-\right.\right.$$
$$\left.\left.c\left(140c^2d^2+27b^2e^2-4ce(35bd-8ae)\right)x\right)\right)\Big/\left(12(b^2-4ac)^3(a+bx+cx^2)^2\right)+$$
$$\left(5(2cd-be)\left(7c^2d^2+b^2e^2-ce(7bd-3ae)\right)(d+ex)(bd-2ae+(2cd-be)x)\right)\Big/$$
$$\left(2(b^2-4ac)^4(a+bx+cx^2)\right)-\frac{1}{(b^2-4ac)^{9/2}}$$
$$10(2cd-be)(cd^2-bde+ae^2)\left(7c^2d^2+b^2e^2-ce(7bd-3ae)\right)\text{ArcTanh}\left[\frac{b+2cx}{\sqrt{b^2-4ac}}\right]$$

Result (type 3, 985 leaves) :

$$\frac{1}{12}\left(\left(30\,(2\,c\,d-b\,e)\,\left(7\,c^3\,d^4-2\,c^2\,d^2\,e\,(7\,b\,d-5\,a\,e)+b^2\,e^3\,(-b\,d+a\,e)+c\,e^2\,\left(8\,b^2\,d^2-10\,a\,b\,d\,e+3\,a^2\,e^2\right)\right)\,(b+2\,c\,x)\right)\Big/\left(c\,\left(b^2-4\,a\,c\right)^4\,(a+x\,(b+c\,x))\right)+\frac{1}{c^3\,\left(-b^2+4\,a\,c\right)^3\,(a+x\,(b+c\,x))^2}\left(5\,b^5\,c\,d\,e^4+3\,b^6\,e^5+4\,c^3\,\left(-48\,a^3\,e^5+35\,c^3\,d^5\,x+50\,a\,c^2\,d^3\,e^2\,x+15\,a^2\,c\,d\,e^4\,x\right)+b^2\,c^2\,e\,\left(129\,a^2\,e^4-25\,c^2\,d^3\,(7\,d-12\,e\,x)-30\,a\,c\,d\,e^2\,(5\,d-4\,e\,x)\right)+10\,b\,c^3\,\left(7\,c^2\,d^4\,(d-5\,e\,x)+10\,a\,c\,d^2\,e^2\,(d-3\,e\,x)+3\,a^2\,e^4\,(d-e\,x)\right)+10\,b^3\,c^2\,e^2\,\left(5\,c\,d^2\,(3\,d-2\,e\,x)+a\,e^2\,(6\,d-e\,x)\right)+b^4\,c\,e^3\,\left(-41\,a\,e^2+10\,c\,d\,(-5\,d+e\,x)\right)\right)-\left(3\,\left(b^5\,e^5\,x+b^4\,e^4\,(a\,e-5\,c\,d\,x)-5\,b^3\,c\,e^3\,\left(-2\,c\,d^2\,x+a\,e\,(d+e\,x)\right)-2\,b^2\,c\,e^2\,\left(2\,a^2\,e^3+5\,c^2\,d^3\,x-5\,a\,c\,d\,e\,(d+2\,e\,x)\right)+2\,c^2\,\left(a^3\,e^5-c^3\,d^5\,x-5\,a^2\,c\,d\,e^3\,(2\,d+e\,x)+5\,a\,c^2\,d^3\,e\,(d+2\,e\,x)\right)+b\,c^2\,\left(-c^2\,d^4\,(d-5\,e\,x)+5\,a^2\,e^4\,(3\,d+e\,x)-10\,a\,c\,d^2\,e^2\,(d+3\,e\,x)\right)\right)\right)\Big/\left(c^4\,\left(-b^2+4\,a\,c\right)\,(a+x\,(b+c\,x))^4\right)+\frac{1}{c^4\,\left(b^2-4\,a\,c\right)^2\,(a+x\,(b+c\,x))^3}\left(-3\,b^6\,e^5+3\,b^5\,c\,e^4\,(5\,d+2\,e\,x)+b^4\,c\,e^3\,\left(27\,a\,e^2-10\,c\,d\,(3\,d+e\,x)\right)-10\,b^3\,c^2\,e^2\,\left(5\,a\,e^2\,(2\,d+e\,x)+c\,d^2\,(-3\,d+2\,e\,x)\right)+4\,c^3\,\left(16\,a^3\,e^5+7\,c^3\,d^5\,x+10\,a\,c^2\,d^3\,e^2\,x-5\,a^2\,c\,d\,e^3\,(16\,d+9\,e\,x)\right)+2\,b\,c^3\,\left(7\,c^2\,d^4\,(d-5\,e\,x)+10\,a\,c\,d^2\,e^2\,(d-3\,e\,x)+5\,a^2\,e^4\,(23\,d+9\,e\,x)\right)+b^2\,c^2\,e\,\left(-83\,a^2\,e^4+5\,c^2\,d^3\,(-7\,d+12\,e\,x)+10\,a\,c\,d\,e^2\,(13\,d+12\,e\,x)\right)\right)+\frac{1}{\left(-b^2+4\,a\,c\right)^{9/2}}120\,(2\,c\,d-b\,e)\,\left(7\,c^3\,d^4-2\,c^2\,d^2\,e\,(7\,b\,d-5\,a\,e)+b^2\,e^3\,(-b\,d+a\,e)+c\,e^2\,\left(8\,b^2\,d^2-10\,a\,b\,d\,e+3\,a^2\,e^2\right)\right)\,\text{ArcTan}\left[\frac{b+2\,c\,x}{\sqrt{-b^2+4\,a\,c}}\right]\right)$$

Problem 2309: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(1+2\,x)^{7/2}}{2+3\,x+5\,x^2}\,dx$$

Optimal (type 3, 279 leaves, 13 steps) :

$$-\frac{76}{125}\sqrt{1+2x}+\frac{16}{75}(1+2x)^{3/2}+\frac{4}{25}(1+2x)^{5/2}+$$

$$\frac{1}{125}\sqrt{\frac{2}{155}\left(-168698+42875\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{125}\sqrt{\frac{2}{155}\left(-168698+42875\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{125}\sqrt{\frac{1}{310}\left(168698+42875\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]+$$

$$\frac{1}{125}\sqrt{\frac{1}{310}\left(168698+42875\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 142 leaves):

$$\frac{8}{375}\sqrt{1+2x}\left(-11+50x+30x^2\right)-$$

$$\frac{2\,i\left(-6696\,i+233\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{3875\sqrt{-10-5\,i\sqrt{31}}}+\frac{2\,i\left(6696\,i+233\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{3875\sqrt{5\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2310: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{16}{25}\sqrt{1+2x}+\frac{4}{15}(1+2x)^{3/2}+$$

$$\frac{1}{25}\sqrt{\frac{2}{155}\left(7162+1225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{25}\sqrt{\frac{2}{155}\left(7162+1225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{25}\sqrt{\frac{1}{310}\left(-7162+1225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]-$$

$$\frac{1}{25}\sqrt{\frac{1}{310}\left(-7162+1225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 137 leaves):

$$\frac{4}{75}\sqrt{1+2x}\ (17+10x)+\frac{2\,i\left(589\,i+178\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{775\sqrt{-10-5\,i\sqrt{31}}}-$$

$$\frac{2\,i\left(-589\,i+178\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{775\sqrt{5\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2311: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 253 leaves, 11 steps):

$$\frac{4}{5}\sqrt{1+2x}+\frac{1}{5}\sqrt{\frac{2}{155}\left(-178+35\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{5}\sqrt{\frac{2}{155}\left(-178+35\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{5}\sqrt{\frac{1}{310}\left(178+35\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]-$$

$$\frac{1}{5}\sqrt{\frac{1}{310}\left(178+35\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]$$

Result (type 3, 130 leaves):

$$\frac{4}{5}\sqrt{1+2x}+\frac{2\left(27\,i+4\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{5\sqrt{-155\,i\left(-2\,i+\sqrt{31}\right)}}+\frac{2\left(-27\,i+4\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{5\sqrt{155\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2312: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{1+2x}}{2+3x+5x^2}\,dx$$

Optimal (type 3, 222 leaves, 10 steps):

$$-\sqrt{\frac{2}{5\left(-2+\sqrt{35}\right)}}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\sqrt{\frac{2}{5\left(-2+\sqrt{35}\right)}}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5\left(1+2x\right)\right]}{\sqrt{10\left(2+\sqrt{35}\right)}}-$$

$$\frac{\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5\left(1+2x\right)\right]}{\sqrt{10\left(2+\sqrt{35}\right)}}$$

Result (type 3, 112 leaves) :

$$\frac{1}{5\sqrt{217}}2\left(\sqrt{-2+\mathrm{i}\sqrt{31}}\left(-2\,\mathrm{i}+\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-\mathrm{i}\sqrt{31}}}\right]+\right.$$
$$\left.\sqrt{-2-\mathrm{i}\sqrt{31}}\left(2\,\mathrm{i}+\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+\mathrm{i}\sqrt{31}}}\right]\right)$$

Problem 2313: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 218 leaves, 10 steps) :

$$-\sqrt{\frac{2}{217}\left(2+\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\sqrt{\frac{2}{217}\left(2+\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]}{\sqrt{14\left(2+\sqrt{35}\right)}}+$$

$$\frac{\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]}{\sqrt{14\left(2+\sqrt{35}\right)}}$$

Result (type 3, 95 leaves):

$$\frac{1}{\sqrt{217}}2\,i\left(-\sqrt{-2+i\sqrt{31}}\ \text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]+\sqrt{-2-i\sqrt{31}}\ \text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]\right)$$

Problem 2314: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 253 leaves, 11 steps):

$$-\frac{4}{7\sqrt{1+2x}}+\frac{1}{7}\sqrt{\frac{2}{217}\left(-178+35\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{7}\sqrt{\frac{2}{217}\left(-178+35\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{7}\sqrt{\frac{1}{434}\left(178+35\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]+$$

$$\frac{1}{7}\sqrt{\frac{1}{434}\left(178+35\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\left(1+2x\right)\right]$$

Result (type 3, 130 leaves):

$$-\frac{4}{7\sqrt{1+2x}}-\frac{2\left(2\,i+\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{7\sqrt{-\frac{31}{5}\,i\left(-2\,i+\sqrt{31}\right)}}-\frac{2\left(-2\,i+\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{7\sqrt{\frac{31}{5}\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2315: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{4}{21\,(1+2x)^{3/2}}-\frac{16}{49\,\sqrt{1+2x}}+$$

$$\frac{1}{49}\sqrt{\frac{2}{217}\left(7162+1225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{49}\sqrt{\frac{2}{217}\left(7162+1225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{49}\sqrt{\frac{1}{434}\left(-7162+1225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]+$$

$$\frac{1}{49}\sqrt{\frac{1}{434}\left(-7162+1225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 139 leaves) :

$$\frac{1}{4557}2\left(-\frac{62\,(19+24x)}{(1+2x)^{3/2}}+\frac{3\,i\left(124\,i+27\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,i\left(-2\,i+\sqrt{31}\right)}}-\frac{3\left(124+27\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,i\left(2\,i+\sqrt{31}\right)}}\right)$$

Problem 2316: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(1+2x)^{7/2}}{\left(2+3x+5x^2\right)^2}\,dx$$

Optimal (type 3, 296 leaves, 13 steps) :

$$\frac{604}{775}\sqrt{1+2x}-\frac{8}{155}(1+2x)^{3/2}-\frac{(5-4x)(1+2x)^{5/2}}{31(2+3x+5x^2)}+$$

$$\frac{1}{775}\sqrt{\frac{2}{155}\left(-5682718+968975\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{775}\sqrt{\frac{2}{155}\left(-5682718+968975\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{775}\sqrt{\frac{1}{310}\left(5682718+968975\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]-$$

$$\frac{1}{775}\sqrt{\frac{1}{310}\left(5682718+968975\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 150 leaves):

$$\frac{\sqrt{1+2x}\left(1003+1132x+2480x^2\right)}{775\left(2+3x+5x^2\right)}+$$

$$\frac{2\left(25234+3657\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{24025\sqrt{-10-5\,i\sqrt{31}}}+\frac{2\left(25234-3657\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{24025\sqrt{5\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2317: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 283 leaves, 12 steps):

$$-\frac{8}{155}\sqrt{1+2x}-\frac{(5-4x)(1+2x)^{3/2}}{31(2+3x+5x^2)}-$$

$$\frac{1}{155}\sqrt{\frac{2}{155}\left(32678+10325\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{155}\sqrt{\frac{2}{155}\left(32678+10325\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{155}\sqrt{\frac{1}{310}\left(-32678+10325\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]-$$

$$\frac{1}{155}\sqrt{\frac{1}{310}\left(-32678+10325\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 147 leaves) :

$$-\frac{\sqrt{1+2x}\,(41+54x)}{155\,(2+3x+5x^2)}+\frac{2\left(-264\,i+97\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{155\sqrt{-155\,i\left(-2\,i+\sqrt{31}\right)}}+$$

$$\frac{2\left(264\,i+97\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{155\sqrt{155\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2318: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 270 leaves, 11 steps) :

$$-\frac{(5-4x)\sqrt{1+2x}}{31\left(2+3x+5x^2\right)}-\frac{1}{31}\sqrt{\frac{2}{155}\left(218+47\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{31}\sqrt{\frac{2}{155}\left(218+47\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{31}\sqrt{\frac{1}{310}\left(-218+47\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\left(1+2x\right)\right]+$$

$$\frac{1}{31}\sqrt{\frac{1}{310}\left(-218+47\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\left(1+2x\right)\right]$$

Result (type 3, 145 leaves):

$$\frac{\sqrt{1+2x}\,\left(-5+4x\right)}{31\left(2+3x+5x^2\right)}+\frac{2\left(62-39\,\text{i}\,\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-\text{i}\sqrt{31}}}\right]}{961\sqrt{-10-5\,\text{i}\,\sqrt{31}}}+\frac{2\left(62+39\,\text{i}\,\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+\text{i}\sqrt{31}}}\right]}{961\sqrt{5\,\text{i}\left(2\,\text{i}+\sqrt{31}\right)}}$$

Problem 2319: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 270 leaves, 11 steps):

$$\frac{\sqrt{1+2x}\,(3+10x)}{31\,(2+3x+5x^2)}-\frac{1}{31}\sqrt{\frac{2}{217}\left(218+47\sqrt{35}\right)}\,\mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{31}\sqrt{\frac{2}{217}\left(218+47\sqrt{35}\right)}\,\mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{31}\sqrt{\frac{1}{434}\left(-218+47\sqrt{35}\right)}\,\mathrm{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]-$$

$$\frac{1}{31}\sqrt{\frac{1}{434}\left(-218+47\sqrt{35}\right)}\,\mathrm{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 143 leaves):

$$\frac{2}{961}\left(\frac{31\sqrt{1+2x}\,(3+10x)}{4+6x+10x^2}+\frac{\left(-4\,i+\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{155}\,i\left(-2\,i+\sqrt{31}\right)}}+\frac{\left(4\,i+\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{155}\,i\left(2\,i+\sqrt{31}\right)}}\right)$$

Problem 2320: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 270 leaves, 11 steps):

$$\frac{\sqrt{1+2x}\,(37+20x)}{217\,(2+3x+5x^2)}-\frac{1}{217}\sqrt{\frac{2}{217}\left(32678+10325\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{217}\sqrt{\frac{2}{217}\left(32678+10325\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{217}\sqrt{\frac{1}{434}\left(-32678+10325\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]+$$

$$\frac{1}{217}\sqrt{\frac{1}{434}\left(-32678+10325\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 147 leaves):

$$\frac{1}{6727}2\left(\frac{31\sqrt{1+2x}\,(37+20x)}{4+6x+10x^2}+\frac{\left(62-101\,\mathrm{i}\,\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-\mathrm{i}\,\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,\mathrm{i}\left(-2\,\mathrm{i}+\sqrt{31}\right)}}+\frac{\left(62+101\,\mathrm{i}\,\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+\mathrm{i}\,\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,\mathrm{i}\left(2\,\mathrm{i}+\sqrt{31}\right)}}\right)$$

Problem 2321: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 283 leaves, 12 steps):

$$-\frac{604}{1519\sqrt{1+2x}}+\frac{37+20x}{217\sqrt{1+2x}\,\left(2+3x+5x^2\right)}+$$

$$\frac{\sqrt{\frac{2}{217}\left(-5682718+968975\sqrt{35}\right)}\,\mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{1519}-$$

$$\frac{\sqrt{\frac{2}{217}\left(-5682718+968975\sqrt{35}\right)}\,\mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{1519}-\frac{1}{1519}$$

$$\sqrt{\frac{1}{434}\left(5682718+968975\sqrt{35}\right)}\,\mathrm{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\left(1+2x\right)\right]+$$

$$\frac{1}{1519}\sqrt{\frac{1}{434}\left(5682718+968975\sqrt{35}\right)}\,\mathrm{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\left(1+2x\right)\right]$$

Result (type 3, 160 leaves):

$$\frac{1}{47089}2\left(-\frac{31\left(949+1672x+3020x^2\right)}{2\sqrt{1+2x}\,\left(2+3x+5x^2\right)}-\right.$$

$$\left.\frac{i\left(-4681\,i+512\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,i\left(-2\,i+\sqrt{31}\right)}}+\frac{i\left(4681\,i+512\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,i\left(2\,i+\sqrt{31}\right)}}\right)$$

Problem 2322: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 296 leaves, 13 steps):

$$-\frac{820}{4557\,(1+2x)^{3/2}}-\frac{4680}{10633\,\sqrt{1+2x}}+\frac{37+20x}{217\,(1+2x)^{3/2}\,(2+3x+5x^2)}+$$
$$\frac{5\sqrt{\frac{2}{217}\left(12504542+2632525\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{10633}-$$
$$\frac{5\sqrt{\frac{2}{217}\left(12504542+2632525\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{10633}-\frac{1}{10633}$$
$$5\sqrt{\frac{1}{434}\left(-12504542+2632525\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]+$$
$$\frac{1}{10633}5\sqrt{\frac{1}{434}\left(-12504542+2632525\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 165 leaves):

$$\frac{1}{988869}2\left(-\frac{31\left(34121+112560x+183140x^2+140400x^3\right)}{2\,(1+2x)^{3/2}\,(2+3x+5x^2)}+\right.$$
$$\left.\frac{15\,i\left(7254\,i+967\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,i\left(-2\,i+\sqrt{31}\right)}}-\frac{15\,i\left(-7254\,i+967\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,i\left(2\,i+\sqrt{31}\right)}}\right)$$

Problem 2323: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(1+2x)^{9/2}}{\left(2+3x+5x^2\right)^3}\,dx$$

Optimal (type 3, 313 leaves, 13 steps):

$$-\frac{1584\sqrt{1+2x}}{24025}-\frac{(5-4x)(1+2x)^{7/2}}{62\left(2+3x+5x^2\right)^2}-\frac{(1143-1088x)(1+2x)^{3/2}}{9610\left(2+3x+5x^2\right)}-$$

$$\frac{3\sqrt{\frac{1}{310}\left(250141922+64681225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{24025}+$$

$$\frac{3\sqrt{\frac{1}{310}\left(250141922+64681225\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{24025}+\frac{1}{48050}$$

$$3\sqrt{\frac{1}{310}\left(-250141922+64681225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]-$$

$$\frac{1}{48050}3\sqrt{\frac{1}{310}\left(-250141922+64681225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 161 leaves):

$$\frac{1}{3723875}\left(-\frac{155\sqrt{1+2x}\left(27977+87291x+144557x^2+86150x^3\right)}{2\left(2+3x+5x^2\right)^2}+\right.$$

$$\left.\frac{3\left(228749-23998\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}i\left(-2i+\sqrt{31}\right)}}+\frac{3\left(228749+23998\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}i\left(2i+\sqrt{31}\right)}}\right)$$

Problem 2324: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(1+2x)^{7/2}}{\left(2+3x+5x^2\right)^3}\,dx$$

Optimal (type 3, 300 leaves, 12 steps):

$$-\frac{(5-4x)(1+2x)^{5/2}}{62\left(2+3x+5x^2\right)^2}-\frac{(957-592x)\sqrt{1+2x}}{9610\left(2+3x+5x^2\right)}-$$

$$\frac{\sqrt{\frac{1}{310}\left(9651062+1806875\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{4805}+$$

$$\frac{\sqrt{\frac{1}{310}\left(9651062+1806875\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{4805}-\frac{1}{9610}$$

$$\sqrt{\frac{1}{310}\left(-9651062+1806875\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]+$$

$$\frac{1}{9610}\sqrt{\frac{1}{310}\left(-9651062+1806875\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 159 leaves):

$$\frac{1}{744775}\left(\frac{155\sqrt{1+2x}\left(-2689-4167x-3629x^2+5440x^3\right)}{2\left(2+3x+5x^2\right)^2}+\right.$$

$$\left.\frac{\left(16864-7353\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}i\left(-2i+\sqrt{31}\right)}}+\frac{\left(16864+7353\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}i\left(2i+\sqrt{31}\right)}}\right)$$

Problem 2325: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 300 leaves, 12 steps):

$$-\frac{(5-4x)(1+2x)^{3/2}}{62\left(2+3x+5x^2\right)^2}+\frac{3\sqrt{1+2x}\,(11+78x)}{1922\left(2+3x+5x^2\right)}-$$

$$\frac{3}{961}\sqrt{\frac{1}{310}\left(15082+2705\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{3}{961}\sqrt{\frac{1}{310}\left(15082+2705\sqrt{35}\right)}\ \text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+\frac{1}{1922}$$

$$3\sqrt{\frac{1}{310}\left(-15082+2705\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]-$$

$$\frac{1}{1922}3\sqrt{\frac{1}{310}\left(-15082+2705\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 155 leaves) :

$$\frac{\sqrt{1+2x}\left(-89+381x+1115x^2+1170x^3\right)}{1922\left(2+3x+5x^2\right)^2}+$$

$$\frac{3\left(1209-218\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{29791\sqrt{-10-5\,i\sqrt{31}}}+\frac{3\left(1209+218\,i\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{29791\sqrt{5\,i\left(2\,i+\sqrt{31}\right)}}$$

Problem 2326: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 300 leaves, 12 steps) :

$$-\frac{(5-4x)\sqrt{1+2x}}{62\left(2+3x+5x^2\right)^2}+\frac{\sqrt{1+2x}\,(67+120x)}{1922\left(2+3x+5x^2\right)}-$$

$$\frac{3}{961}\sqrt{\frac{1}{434}\left(15082+2705\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{3}{961}\sqrt{\frac{1}{434}\left(15082+2705\sqrt{35}\right)}\,\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-\frac{1}{1922}$$

$$3\sqrt{\frac{1}{434}\left(-15082+2705\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5(1+2x)\right]+$$

$$\frac{1}{1922}3\sqrt{\frac{1}{434}\left(-15082+2705\sqrt{35}\right)}\,\text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5(1+2x)\right]$$

Result (type 3, 161 leaves):

$$\frac{1}{29791}\left(\frac{31\sqrt{1+2x}\left(-21+565x+695x^2+600x^3\right)}{2\left(2+3x+5x^2\right)^2}+\frac{3\left(124-47\,\mathrm{i}\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-\mathrm{i}\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,\mathrm{i}\left(-2\,\mathrm{i}+\sqrt{31}\right)}}+\frac{3\left(124+47\,\mathrm{i}\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+\mathrm{i}\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,\mathrm{i}\left(2\,\mathrm{i}+\sqrt{31}\right)}}\right)$$

Problem 2327: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 300 leaves, 12 steps):

$$\frac{\sqrt{1+2x}\,(3+10x)}{62\,(2+3x+5x^2)^2}+\frac{\sqrt{1+2x}\,(599+1790x)}{13454\,(2+3x+5x^2)}-$$

$$\frac{\sqrt{\frac{1}{434}\left(9651062+1806875\sqrt{35}\right)}\ \mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{6727}+$$

$$\frac{\sqrt{\frac{1}{434}\left(9651062+1806875\sqrt{35}\right)}\ \mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{6727}+\frac{1}{13454}$$

$$\sqrt{\frac{1}{434}\left(-9651062+1806875\sqrt{35}\right)}\ \mathrm{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]-$$

$$\frac{1}{13454}\sqrt{\frac{1}{434}\left(-9651062+1806875\sqrt{35}\right)}\ \mathrm{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\,\sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 159 leaves) :

$$\frac{1}{208537}\left(\frac{31\sqrt{1+2x}\,\left(1849+7547x+8365x^2+8950x^3\right)}{2\,(2+3x+5x^2)^2}+\right.$$

$$\left.\frac{\left(5549-902\,i\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,i\left(-2\,i+\sqrt{31}\right)}}+\frac{\left(5549+902\,i\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,i\left(2\,i+\sqrt{31}\right)}}\right)$$

Problem 2328: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 314 leaves, 12 steps) :

$$\frac{\sqrt{1+2x}\,(37+20x)}{434\,(2+3x+5x^2)^2}+\frac{\sqrt{1+2x}\,(9227+7920x)}{94178\,(2+3x+5x^2)}-$$

$$\frac{3\sqrt{\frac{1}{434}\left(2+\sqrt{35}\right)}\left(7379+264\sqrt{35}\right)\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{47089}+$$

$$\frac{3\sqrt{\frac{1}{434}\left(2+\sqrt{35}\right)}\left(7379+264\sqrt{35}\right)\text{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]}{47089}-\frac{1}{94178}$$

$$3\sqrt{\frac{1}{434}\left(-250141922+64681225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]+$$

$$\frac{1}{94178}3\sqrt{\frac{1}{434}\left(-250141922+64681225\sqrt{35}\right)}\ \text{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\ \sqrt{1+2x}+5\,(1+2x)\right]$$

Result (type 3, 161 leaves):

$$\frac{1}{1459759}\left(\frac{31\sqrt{1+2x}\,\left(26483+47861x+69895x^2+39600x^3\right)}{2\,(2+3x+5x^2)^2}+\right.$$

$$\left.\frac{3\left(8184-7907\,\mathrm{i}\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-\mathrm{i}\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}\,\mathrm{i}\left(-2\,\mathrm{i}+\sqrt{31}\right)}}+\frac{3\left(8184+7907\,\mathrm{i}\sqrt{31}\right)\text{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+\mathrm{i}\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}\,\mathrm{i}\left(2\,\mathrm{i}+\sqrt{31}\right)}}\right)$$

Problem 2329: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 313 leaves, 13 steps):

$$-\frac{81090}{329623\sqrt{1+2x}}+\frac{37+20x}{434\sqrt{1+2x}\left(2+3x+5x^2\right)^2}+\frac{5\left(2329+2080x\right)}{94178\sqrt{1+2x}\left(2+3x+5x^2\right)}-\frac{1}{329623}$$

$$15\sqrt{\frac{1}{434}\left(-2257111762+387427075\sqrt{35}\right)}\ \mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}-10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]+$$

$$\frac{1}{329623}15\sqrt{\frac{1}{434}\left(-2257111762+387427075\sqrt{35}\right)}\ \mathrm{ArcTan}\left[\frac{\sqrt{10\left(2+\sqrt{35}\right)}+10\sqrt{1+2x}}{\sqrt{10\left(-2+\sqrt{35}\right)}}\right]-$$

$$\frac{1}{659246}15\sqrt{\frac{1}{434}\left(2257111762+387427075\sqrt{35}\right)}$$

$$\mathrm{Log}\left[\sqrt{35}-\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5\left(1+2x\right)\right]+\frac{1}{659246}$$

$$15\sqrt{\frac{1}{434}\left(2257111762+387427075\sqrt{35}\right)}\ \mathrm{Log}\left[\sqrt{35}+\sqrt{10\left(2+\sqrt{35}\right)}\sqrt{1+2x}+5\left(1+2x\right)\right]$$

Result (type 3, 170 leaves) :

$$\frac{1}{10218313}\left(-\frac{31\left(429487+1525635x+4077245x^2+4501400x^3+4054500x^4\right)}{2\sqrt{1+2x}\left(2+3x+5x^2\right)^2}-\right.$$

$$\frac{15\,i\left(-83793\,i+12686\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2-i\sqrt{31}}}\right]}{\sqrt{-\frac{1}{5}i\left(-2i+\sqrt{31}\right)}}+$$

$$\left.\frac{15\,i\left(83793\,i+12686\sqrt{31}\right)\mathrm{ArcTan}\left[\frac{\sqrt{5+10x}}{\sqrt{-2+i\sqrt{31}}}\right]}{\sqrt{\frac{1}{5}i\left(2i+\sqrt{31}\right)}}\right)$$

Problem 2355: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 400 leaves, 7 steps) :

$$\frac{1}{32768\,c^6}5\,(b^2-4\,a\,c)^2\,(2\,c\,d-b\,e)\,(32\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(8\,b\,d+3\,a\,e))\,(b+2\,c\,x)\,\sqrt{a+b\,x+c\,x^2}-\frac{1}{12288\,c^5}5\,(b^2-4\,a\,c)\,(2\,c\,d-b\,e)\,(32\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(8\,b\,d+3\,a\,e))\,(b+2\,c\,x)\,(a+b\,x+c\,x^2)^{3/2}+\frac{1}{768\,c^4}(2\,c\,d-b\,e)\,(32\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(8\,b\,d+3\,a\,e))\,(b+2\,c\,x)\,(a+b\,x+c\,x^2)^{5/2}+\frac{e\,(d+e\,x)^2\,(a+b\,x+c\,x^2)^{7/2}}{9\,c}+\frac{1}{2016\,c^3}e\,(640\,c^2\,d^2+99\,b^2\,e^2-2\,c\,e\,(243\,b\,d+32\,a\,e)+154\,c\,e\,(2\,c\,d-b\,e)\,x)\,(a+b\,x+c\,x^2)^{7/2}-\frac{1}{65536\,c^{13/2}}5\,(b^2-4\,a\,c)^3\,(2\,c\,d-b\,e)\,(32\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(8\,b\,d+3\,a\,e))\,\text{ArcTanh}\left[\frac{b+2\,c\,x}{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}\right]$$

Result (type 3, 807 leaves):

$$\frac{1}{4128768\,c^{13/2}}\Big(2\,\sqrt{c}\,\sqrt{a+x\,(b+c\,x)}\,\big(-3465\,b^8\,e^3+210\,b^7\,c\,e^2\,(81\,d+11\,e\,x)-84\,b^6\,c\,e\,(-485\,a\,e^2+c\,(360\,d^2+135\,d\,e\,x+22\,e^2\,x^2))+72\,b^5\,c^2\,(-7\,a\,e^2\,(375\,d+49\,e\,x)+2\,c\,(140\,d^3+140\,d^2\,e\,x+63\,d\,e^2\,x^2+11\,e^3\,x^3))-16\,b^4\,c^2\,(10143\,a^2\,e^3-9\,a\,c\,e\,(2240\,d^2+791\,d\,e\,x+124\,e^2\,x^2)+2\,c^2\,x\,(420\,d^3+504\,d^2\,e\,x+243\,d\,e^2\,x^2+44\,e^3\,x^3))+32\,b^3\,c^3\,(9\,a^2\,e^2\,(2359\,d+293\,e\,x)+8\,c^2\,x^2\,(42\,d^3+54\,d^2\,e\,x+27\,d\,e^2\,x^2+5\,e^3\,x^3)-4\,a\,c\,(1680\,d^3+1512\,d^2\,e\,x+639\,d\,e^2\,x^2+107\,e^3\,x^3))+192\,b^2\,c^3\,(1221\,a^3\,e^3-a^2\,c\,e\,(5544\,d^2+1791\,d\,e\,x+266\,e^2\,x^2)+4\,a\,c^2\,x\,(168\,d^3+180\,d^2\,e\,x+81\,d\,e^2\,x^2+14\,e^3\,x^3)+8\,c^3\,x^3\,(378\,d^3+888\,d^2\,e\,x+729\,d\,e^2\,x^2+206\,e^3\,x^3))+128\,b\,c^4\,(-13\,a^3\,e^2\,(459\,d+53\,e\,x)+6\,a^2\,c\,(924\,d^3+684\,d^2\,e\,x+261\,d\,e^2\,x^2+41\,e^3\,x^3)+24\,a\,c^2\,x^2\,(546\,d^3+1182\,d^2\,e\,x+921\,d\,e^2\,x^2+251\,e^3\,x^3)+16\,c^3\,x^4\,(420\,d^3+1044\,d^2\,e\,x+891\,d\,e^2\,x^2+259\,e^3\,x^3))+256\,c^4\,(-256\,a^4\,e^3+a^3\,c\,e\,(3456\,d^2+945\,d\,e\,x+128\,e^2\,x^2)+16\,c^4\,x^5\,(84\,d^3+216\,d^2\,e\,x+189\,d\,e^2\,x^2+56\,e^3\,x^3)+8\,a\,c^3\,x^3\,(546\,d^3+1296\,d^2\,e\,x+1071\,d\,e^2\,x^2+304\,e^3\,x^3)+6\,a^2\,c^2\,x\,(924\,d^3+1728\,d^2\,e\,x+1239\,d\,e^2\,x^2+320\,e^3\,x^3))\big)+315\,(b^2-4\,a\,c)^3\,(-2\,c\,d+b\,e)\,(32\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(8\,b\,d+3\,a\,e))\,\text{Log}\left[b+2\,c\,x+2\,\sqrt{c}\,\sqrt{a+x\,(b+c\,x)}\right]\Big)$$

Problem 2440: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 504 leaves, 8 steps):

$$-\frac{4\left(8 b^4-36 a b^2 c+21 a^2 c^2\right) d^3 x \sqrt{a+b x+c x^2}}{315 c^{7/2} \sqrt{d x}\left(\sqrt{a}+\sqrt{c}\, x\right)}+\frac{2 d^2 \sqrt{d x}\left(b\left(8 b^2+3 a c\right)+3 c\left(8 b^2-7 a c\right) x\right) \sqrt{a+b x+c x^2}}{315 c^3}-\frac{4 b d^2 \sqrt{d x}\left(a+b x+c x^2\right)^{3/2}}{21 c^2}+\frac{2 d (d x)^{3/2}\left(a+b x+c x^2\right)^{3/2}}{9 c}+$$

$$\left(4 a^{1/4}\left(8 b^4-36 a b^2 c+21 a^2 c^2\right) d^3 \sqrt{x}\left(\sqrt{a}+\sqrt{c}\, x\right) \sqrt{\frac{a+b x+c x^2}{\left(\sqrt{a}+\sqrt{c}\, x\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(315 c^{15/4} \sqrt{d x} \sqrt{a+b x+c x^2}\right)-$$

$$\left(a^{1/4}\left(16 b^4-72 a b^2 c+42 a^2 c^2+\sqrt{a}\, b \sqrt{c}\left(8 b^2-27 a c\right)\right) d^3 \sqrt{x}\left(\sqrt{a}+\sqrt{c}\, x\right) \sqrt{\frac{a+b x+c x^2}{\left(\sqrt{a}+\sqrt{c}\, x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(315 c^{15/4} \sqrt{d x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 594 leaves) :

$$\frac{1}{315\, c^4\, x^{5/2} \sqrt{a+x\,(b+c\,x)}}\,(d\,x)^{5/2} \left(-\frac{4\,\left(8\,b^4-36\,a\,b^2\,c+21\,a^2\,c^2\right)\,\left(a+x\,(b+c\,x)\right)}{\sqrt{x}} + 2\,c\,\sqrt{x}\,\left(a+x\,(b+c\,x)\right)\,\left(8\,b^3-6\,b^2\,c\,x+b\,c\,\left(-27\,a+5\,c\,x^2\right)+7\,c^2\,x\,\left(2\,a+5\,c\,x^2\right)\right) + \frac{1}{\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}\, i\,\left(8\,b^4-36\,a\,b^2\,c+21\,a^2\,c^2\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right) \sqrt{2+\frac{4\,a}{\left(b+\sqrt{b^2-4\,a\,c}\right)\,x}}\; x\,\sqrt{\frac{2\,a+b\,x-\sqrt{b^2-4\,a\,c}\;x}{b\,x-\sqrt{b^2-4\,a\,c}\;x}}\; \mathrm{EllipticE}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}{\sqrt{x}}\right],\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right] - \frac{1}{\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}\, i\,\left(-8\,b^5+44\,a\,b^3\,c-48\,a^2\,b\,c^2+8\,b^4\,\sqrt{b^2-4\,a\,c}-36\,a\,b^2\,c\,\sqrt{b^2-4\,a\,c}+21\,a^2\,c^2\,\sqrt{b^2-4\,a\,c}\right) \sqrt{2+\frac{4\,a}{\left(b+\sqrt{b^2-4\,a\,c}\right)\,x}}\; x\,\sqrt{\frac{2\,a+b\,x-\sqrt{b^2-4\,a\,c}\;x}{b\,x-\sqrt{b^2-4\,a\,c}\;x}}\; \mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}{\sqrt{x}}\right],\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]\right)$$

Problem 2441: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 581 leaves, 7 steps):

$$\frac{1}{105 c^2 e} 2 \sqrt{d+e x} \left(3 c^2 d^2-4 b^2 e^2+c e (9 b d-5 a e)+12 c e (2 c d-b e) x\right) \sqrt{a+b x+c x^2}+\frac{2 e \sqrt{d+e x} \left(a+b x+c x^2\right)^{3/2}}{7 c}-$$

$$\left(\sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \left(3 c^2 d^2+8 b^2 e^2-c e (3 b d+29 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/$$

$$\left(105 c^3 e^2 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)+$$

$$\left(4 \sqrt{2} \sqrt{b^2-4 a c} \left(c d^2-b d e+a e^2\right) \left(3 c^2 d^2+2 b^2 e^2-c e (3 b d+5 a e)\right)\right.$$

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

$$\left.\left.-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/\left(105 c^3 e^2 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5328 leaves) :

$$\sqrt{d+e x} \left(\frac{2 \left(3 c^2 d^2+9 b c d e-4 b^2 e^2+10 a c e^2\right)}{105 c^2 e}+\frac{2 (8 c d+b e) x}{35 c}+\frac{2 e x^2}{7}\right) \sqrt{a+x (b+c x)}+$$

$$\frac{1}{105\,c^2\,e^3\,\sqrt{a+b\,x+c\,x^2}}$$

$$2\,\sqrt{a+x\,(b+c\,x)}\,\Bigg(-\Bigg(\Bigg((2\,c\,d-b\,e)\,\left(3\,c^2\,d^2-3\,b\,c\,d\,e+8\,b^2\,e^2-29\,a\,c\,e^2\right)\,(d+e\,x)^{3/2}$$

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

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

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

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

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

$$\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-$$

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

$$\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg)\Bigg/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}} \Bigg) -$$

$$\Bigg(9 \, i \, b c^2 d^2 e \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \Bigg(\text{EllipticE}\Big[i \, \text{ArcSinh}\Big[$$

$$\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big] - \text{EllipticF}\Big[i$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big]\Bigg)\Bigg) \Big/$$

$$\Bigg(2 \sqrt{2} \left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}$$

$$\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}} \Bigg) + \Bigg(19 \, i \, b^2 c d e^2$$

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

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \Bigg(\text{EllipticE}\Big[i \, \text{ArcSinh}\Big[$$

$$\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big] - \text{EllipticF}\Big[i$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(29\,\mathbb{i}\,a c^2 d e^2$$

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

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(2\,\mathbb{i}\sqrt{2}\,b^3 e^3$$

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

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

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\left(29 i a b c e^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

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

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

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Big/$$

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

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

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

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Big/$$

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

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

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

$$\text{EllipticF}\left[i \text{ ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right] \Bigg/$$

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

$$\left(5 i \sqrt{2}\, a c^2 e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\text{EllipticF}\left[i \text{ ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right] \Bigg/$$

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

Problem 2442: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{d+e x}\, \sqrt{a+b x+c x^2}\, dx$$

Optimal (type 4, 513 leaves, 7 steps):

$$-\frac{2\left(2 c d-b e\right)\sqrt{d+e x}\sqrt{a+b x+c x^2}}{15 c e}+\frac{2\left(d+e x\right)^{3/2}\sqrt{a+b x+c x^2}}{5 e}-$$

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

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

$$\left(15 c^2 e^2\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{a+b x+c x^2}\right)+$$

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

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

$$\left(15 c^2 e^2\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 3384 leaves) :

$$\left(\frac{2\left(c d+b e\right)}{15 c e}+\frac{2 x}{5}\right)\sqrt{d+e x}\sqrt{a+x\left(b+c x\right)}+$$

$$\frac{1}{15 c e^3\sqrt{a+b x+c x^2}}\sqrt{a+x\left(b+c x\right)}\left(-\left(\left(4\left(c^2 d^2-b c d e+b^2 e^2-3 a c e^2\right)\right.\right.\right.$$

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

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

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

$$\Bigg(\Bigg(\mathbb{i}\, c^2 d^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

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

$$\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{2}\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-$$

$$\Bigg(\mathbb{i}\, b c d e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

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

$$\left(\mathrm{i}\,b^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}} \Bigg) -$$

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

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

$$\Bigg(\text{EllipticE}\Big[i \,\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big] -$$

$$\text{EllipticF}\Big[i \,\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\Big],$$

$$\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big]\Bigg)\Bigg) \Big/ \Bigg(\sqrt{2} \left(c d^2 - b d e + a e^2\right)$$

$$\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}} \Bigg) +$$

$$\Bigg(i \sqrt{2}\, c^2 d \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

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

$$\text{EllipticF}\Big[i \,\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big]\Bigg) \Big/$$

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

$$\left(\mathrm{i}\,b\,c\,e\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left.\left(\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)$$

Problem 2443: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+b\,x+c\,x^2}}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 444 leaves, 6 steps):

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

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

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

$$\left(4\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\right.\right.$$

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

Result (type 4, 1847 leaves) :

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

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

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

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

$$\Bigg(\Bigg(\mathrm{i}\, c d\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\Bigg(\mathrm{i}\, b e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\right/\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

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

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

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

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

Problem 2444: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 419 leaves, 6 steps):

$$-\frac{2\sqrt{a+b\,x+c\,x^2}}{e\sqrt{d+e\,x}}+\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/\left(e^2\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(2\,c\,d-b\,e\right)\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\right.\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/\left(c\,e^2\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 865 leaves):

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

$$\Bigg(4\,c\,e^2\,x^2+4\,e^2\,(a+b\,x)-2\,e^2\,(a+x\,(b+c\,x))-\Bigg(\mathrm{i}\,\sqrt{2}\,\left(2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)\,(d+e\,x)^{3/2}$$

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

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

$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c\,d^2-b\,d\,e+a\,e^2}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}}{\sqrt{d+e\,x}}\right],\,-\frac{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}{2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}\right]\Bigg)\Big/$$

$$\left(\sqrt{\frac{c\,d^2+e\,(-b\,d+a\,e)}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}\right)+\Bigg(\mathrm{i}\,\sqrt{2}\,\sqrt{(b^2-4\,a\,c)\,e^2}\,(d+e\,x)^{3/2}$$

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

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

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c\,d^2-b\,d\,e+a\,e^2}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}}{\sqrt{d+e\,x}}\right],\,-\frac{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}{2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}\right]\Bigg)\Big/$$

$$\left(\sqrt{\frac{c\,d^2+e\,(-b\,d+a\,e)}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}\right)\Bigg)$$

Problem 2445: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 497 leaves, 7 steps):

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

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

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

$$\left(4\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\right.\right.$$

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

Result (type 4, 1914 leaves):

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

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

$$\left(\mathrm{i}\, b\, e \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/ \left(2 \sqrt{2} \left(c d^2 - b d e + a e^2\right)\right.$$

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

$$\left(\mathrm{i} \sqrt{2}\, c \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

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

Problem 2446: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 617 leaves, 8 steps):

$$-\frac{2\sqrt{a+b\,x+c\,x^2}}{5\,e\,(d+e\,x)^{5/2}}+\frac{2\,(2\,c\,d-b\,e)\,\sqrt{a+b\,x+c\,x^2}}{15\,e\,(c\,d^2-b\,d\,e+a\,e^2)\,(d+e\,x)^{3/2}}+$$

$$\frac{4\,(c^2\,d^2+b^2\,e^2-c\,e\,(b\,d+3\,a\,e))\,\sqrt{a+b\,x+c\,x^2}}{15\,e\,(c\,d^2-b\,d\,e+a\,e^2)^2\,\sqrt{d+e\,x}}-$$

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\;e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/$$

$$\left(15\,e^2\,(c\,d^2-b\,d\,e+a\,e^2)^2\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

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

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

$$\left(15\,e^2\,(c\,d^2-b\,d\,e+a\,e^2)\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 3493 leaves):

$$\sqrt{d+e\,x}\,\sqrt{a+x\,(b+c\,x)}$$

$$\left(-\frac{2}{5\,e\,(d+e\,x)^3}-\frac{2\,(-2\,c\,d+b\,e)}{15\,e\,(c\,d^2-b\,d\,e+a\,e^2)\,(d+e\,x)^2}-\frac{4\,(-c^2\,d^2+b\,c\,d\,e-b^2\,e^2+3\,a\,c\,e^2)}{15\,e\,(c\,d^2-b\,d\,e+a\,e^2)^2\,(d+e\,x)}\right)-$$

$$\frac{1}{15\,e^3\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\sqrt{a+b\,x+c\,x^2}}$$

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

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

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

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

$$\left(\left(\mathrm{i}\,c^2\,d^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.\right.$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\right/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\ \sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg) -$$

$$\Bigg(\mathrm{i}\,b\,c\,d\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

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

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big] -$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Big/\Bigg(\sqrt{2}\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\ \sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg) +$$

$$\Bigg(\mathrm{i}\,b^2\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

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

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big] -$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

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

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

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\left(\mathrm{i}\sqrt{2}\,c^2 d\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

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

$$\left(\mathrm{i}\,b c e\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

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

Problem 2447: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 816 leaves, 8 steps):

$$\frac{1}{1155 c^3 e^3}2\sqrt{d+e x}\left(8 c^4 d^4+8 b^4 e^4-c^3 d^2 e(19 b d-42 a e)-b^2 c e^3(19 b d+21 a e)+\right.$$
$$\left.3 c^2 e^2\left(2 b^2 d^2+17 a b d e-10 a^2 e^2\right)-3 c e(2 c d-b e)\left(c^2 d^2+8 b^2 e^2-c e(b d+31 a e)\right)x\right)$$
$$\sqrt{a+b x+c x^2}+\frac{1}{231 c^2 e}2\sqrt{d+e x}\left(c^2 d^2-6 b^2 e^2+c e(13 b d-3 a e)+14 c e(2 c d-b e)x\right)$$

$$\left(a+b x+c x^2\right)^{3/2}+\frac{2 e \sqrt{d+e x}\,\left(a+b x+c x^2\right)^{5/2}}{11 c}-$$

$$\left(8 \sqrt{2}\,\sqrt{b^2-4 a c}\,(2 c d-b e)\left(c^2 d^2-2 b^2 e^2-c e (b d-9 a e)\right)\right.$$

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

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

$$\left(1155 c^4 e^4 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{a+b x+c x^2}\right)+$$

$$\left(2 \sqrt{2}\,\sqrt{b^2-4 a c}\,\left(c d^2-b d e+a e^2\right)\left(16 c^4 d^4-8 b^4 e^4-4 c^3 d^2 e (8 b d-21 a e)+\right.\right.$$

$$\left.b^2 c e^3 (13 b d+51 a e)+3 c^2 e^2\left(b^2 d^2-28 a b d e-20 a^2 e^2\right)\right)\sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}$$

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

$$\left(1155 c^4 e^4 \sqrt{d+e x}\,\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 10 848 leaves) :

$$\frac{1}{a+b x+c x^2}$$

$$\sqrt{d+e\,x}\,\left(\frac{1}{1155\,c^3\,e^3}2\,\left(8\,c^4\,d^4-19\,b\,c^3\,d^3\,e+6\,b^2\,c^2\,d^2\,e^2+47\,a\,c^3\,d^2\,e^2-19\,b^3\,c\,d\,e^3+116\,a\,b\,c^2\,d\,e^3+8\,b^4\,e^4-51\,a\,b^2\,c\,e^4+60\,a^2\,c^2\,e^4\right)+\frac{1}{1155\,c^2\,e^2}4\,\left(-3\,c^3\,d^3+7\,b\,c^2\,d^2\,e+7\,b^2\,c\,d\,e^2+163\,a\,c^2\,d\,e^2-3\,b^3\,e^3+16\,a\,b\,c\,e^3\right)\,x+\frac{2\,\left(c^2\,d^2+41\,b\,c\,d\,e+b^2\,e^2+39\,a\,c\,e^2\right)\,x^2}{231\,c\,e}+\frac{8}{33}\,\left(c\,d+b\,e\right)\,x^3+\frac{2}{11}\,c\,e\,x^4\right)$$

$$\left(a+x\,\left(b+c\,x\right)\right)^{3/2}+\frac{1}{1155\,c^3\,e^5\,\left(a+b\,x+c\,x^2\right)^{3/2}}2\,\left(a+x\,\left(b+c\,x\right)\right)^{3/2}$$

$$\left(-\left(\left(8\,\left(2\,c\,d-b\,e\right)\,\left(c^4\,d^4-2\,b\,c^3\,d^3\,e+6\,a\,c^3\,d^2\,e^2+b^3\,c\,d\,e^3-6\,a\,b\,c^2\,d\,e^3-2\,b^4\,e^4+15\,a\,b^2\,c\,e^4-27\,a^2\,c^2\,e^4\right)\,\left(d+e\,x\right)^{3/2}\,\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\right)+\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\right.$$

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

$$\left(\left(4\,\mathrm{i}\,\sqrt{2}\,c^5\,d^5\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.\right.$$

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

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(10\,\mathbb{i}\sqrt{2}\right.$$

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

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathbb{i}\right.$$

$$\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(4\,\mathbb{i}\sqrt{2}\,b^2 c^3 d^3 e^2\right.$$

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(24\,i\sqrt{2}\right.$$

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

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\,\Bigg)+\Bigg(4\,\mathrm{i}\,\sqrt{2}\,b^3\,c^2\,d^2\,e^3$$

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

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\,\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg((c\,d^2-b\,d\,e+a\,e^2)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\,\Bigg)-\Bigg(36\,\mathrm{i}\,\sqrt{2}\,a\,b\,c^3\,d^2\,e^3$$

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

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

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(10\,\mathrm{i}\,\sqrt{2}$$

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

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

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\Bigg(72\,\mathrm{i}\,\sqrt{2}\ a b^2 c^2 d e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)$$

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

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

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\left(108\, i \sqrt{2}\, a^2 c^3 d e^4 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\right.$$

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

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

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\Bigg(4\,i$$

$$\sqrt{2}\,b^5 e^5\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\Bigg(30\,i\sqrt{2}\,a b^3 c e^5\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)$$

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

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

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

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

$$\left(54 i \sqrt{2}\, a^2 b c^2 e^5 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\right.$$

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

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

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

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

$$\left(8\,\mathrm{i}\,\sqrt{2}\,c^5\,d^4\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

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

$$\left(16\,\mathrm{i}\,\sqrt{2}\,b\,c^4\,d^3\,e\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

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

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

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

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

$$\left(42 i \sqrt{2} a c^4 d^2 e^2 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

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

$$\left(13 i b^3 c^2 d e^3 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

$$\left(42\,\text{i}\sqrt{2}\,a b c^3 d e^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

$$\left(4\,\text{i}\sqrt{2}\,b^4 c e^4\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

$$\left(51 i a b^2 c^2 e^4 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

$$\left(30 i \sqrt{2} a^2 c^3 e^4 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

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

Problem 2448: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 712 leaves, 8 steps) :

$$\frac{1}{315\, c^2\, e^3} 2 \sqrt{d+e\, x}\, \left(8\, c^3\, d^3 - 4\, b^3\, e^3 - 3\, c^2\, d\, e\, (5\, b\, d - 8\, a\, e) + 3\, b\, c\, e^2\, (b\, d + 3\, a\, e) - 6\, c\, e\, \left(c^2\, d^2 + 2\, b^2\, e^2 - c\, e\, (b\, d + 7\, a\, e)\right)\, x\right) \sqrt{a+b\, x+c\, x^2} - \frac{2\, (2\, c\, d - b\, e)\, \sqrt{d+e\, x}\, \left(a+b\, x+c\, x^2\right)^{3/2}}{21\, c\, e} + \frac{2\, (d+e\, x)^{3/2}\, \left(a+b\, x+c\, x^2\right)^{3/2}}{9\, e} -$$

$$\left(\sqrt{2}\, \sqrt{b^2-4\, a\, c}\, \left(16\, c^4\, d^4 - 8\, b^4\, e^4 - 4\, c^3\, d^2\, e\, (8\, b\, d - 15\, a\, e) + b^2\, c\, e^3\, (7\, b\, d + 57\, a\, e) + 3\, c^2\, e^2\, \left(3\, b^2\, d^2 - 20\, a\, b\, d\, e - 28\, a^2\, e^2\right)\right) \sqrt{d+e\, x}\, \sqrt{-\frac{c\, \left(a+b\, x+c\, x^2\right)}{b^2-4\, a\, c}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\, a\, c}+2\, c\, x}{\sqrt{b^2-4\, a\, c}}}}{\sqrt{2}}\right], -\frac{2\, \sqrt{b^2-4\, a\, c}\, e}{2\, c\, d - \left(b+\sqrt{b^2-4\, a\, c}\right) e}\right]\right) \Bigg/ \left(315\, c^3\, e^4\, \sqrt{\frac{c\, (d+e\, x)}{2\, c\, d - \left(b+\sqrt{b^2-4\, a\, c}\right) e}}\, \sqrt{a+b\, x+c\, x^2}\right) +$$

$$\left(8\, \sqrt{2}\, \sqrt{b^2-4\, a\, c}\, (2\, c\, d - b\, e)\, \left(c\, d^2 - b\, d\, e + a\, e^2\right)\, \left(2\, c^2\, d^2 - b^2\, e^2 - 2\, c\, e\, (b\, d - 3\, a\, e)\right) \sqrt{\frac{c\, (d+e\, x)}{2\, c\, d - \left(b+\sqrt{b^2-4\, a\, c}\right) e}}\, \sqrt{-\frac{c\, \left(a+b\, x+c\, x^2\right)}{b^2-4\, a\, c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\, a\, c}+2\, c\, x}{\sqrt{b^2-4\, a\, c}}}}{\sqrt{2}}\right], -\frac{2\, \sqrt{b^2-4\, a\, c}\, e}{2\, c\, d - \left(b+\sqrt{b^2-4\, a\, c}\right) e}\right]\right) \Bigg/ \left(315\, c^3\, e^4\, \sqrt{d+e\, x}\, \sqrt{a+b\, x+c\, x^2}\right)$$

Result (type 4, 7541 leaves):

$$\frac{1}{a+b x+c x^2}\sqrt{d+e x}\left(\frac{1}{315 c^2 e^3}2\left(8 c^3 d^3-15 b c^2 d^2 e+3 b^2 c d e^2+29 a c^2 d e^2-4 b^3 e^3+24 a b c e^3\right)+\frac{2\left(-6 c^2 d^2+11 b c d e+3 b^2 e^2+77 a c e^2\right) x}{315 c e^2}+\frac{2\left(c d+10 b e\right) x^2}{63 e}+\frac{2 c x^3}{9}\right)$$

$$\left(a+x\left(b+c x\right)\right)^{3/2}+\frac{1}{315 c^2 e^5\left(a+b x+c x^2\right)^{3/2}}$$

$$\left(a+x\left(b+c x\right)\right)^{3/2}\left(-\left(\left(2\left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+60 a c^3 d^2 e^2+\right.\right.\right.\right.$$

$$7 b^3 c d e^3-60 a b c^2 d e^3-8 b^4 e^4+57 a b^2 c e^4-84 a^2 c^2 e^4\Big)$$

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

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

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

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(8\,i\,\sqrt{2}\right.$$

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(9\,i\,b^2\right.$$

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

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

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(15 i \sqrt{2}\, a c^3 d^2 e^2\right.$$

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

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

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\Bigg(7 i b^3 c d e^3 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}} \Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[i$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(15 i\sqrt{2}\, a b c^2 d e^3$$

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

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

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

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

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(2\,i\right.$$

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(57\,i\right.$$

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

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

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(21\,i\sqrt{2}\,a^2 c^2 e^4\right.$$

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg) +$$

$$\left(8 i \sqrt{2} c^4 d^3 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

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

$$\left(12 i \sqrt{2} b c^3 d^2 e \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

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

$$\left(24 i \sqrt{2} a c^3 d e^2 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

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

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

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

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

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

$$\left(12\,\mathbb{i}\sqrt{2}\,a b c^2 e^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2449: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 579 leaves, 7 steps):

$$\frac{1}{35\,c\,e^3}2\sqrt{d+e\,x}\,\left(8\,c^2\,d^2+b^2\,e^2-c\,e\,\left(11\,b\,d-10\,a\,e\right)-3\,c\,e\,\left(2\,c\,d-b\,e\right)\,x\right)\,\sqrt{a+b\,x+c\,x^2}\,+$$

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

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(35\,c^2\,e^4\,\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(16\,c^2\,d^2-b^2\,e^2-4\,c\,e\,\left(4\,b\,d-5\,a\,e\right)\right)\right.$$

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

$$\left.\left.-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/\left(35\,c^2\,e^4\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 5338 leaves):

$$\frac{1}{a+b\,x+c\,x^2}$$

$$\sqrt{d+e\,x}\,\left(\frac{2\,\left(8\,c^2\,d^2-11\,b\,c\,d\,e+b^2\,e^2+15\,a\,c\,e^2\right)}{35\,c\,e^3}+\frac{4\,\left(-3\,c\,d+4\,b\,e\right)\,x}{35\,e^2}+\frac{2\,c\,x^2}{7\,e}\right)\,\left(a+x\,\left(b+c\,x\right)\right)^{3/2}+$$

$$\frac{1}{35\,c\,e^5\,\left(a+b\,x+c\,x^2\right)^{3/2}}\,\left(a+x\,\left(b+c\,x\right)\right)^{3/2}\,\Bigg(-\Bigg(\Bigg(4\,\left(2\,c\,d-b\,e\right)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2+8\,a\,c\,e^2\right)$$

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

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

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

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

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

$$\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-$$

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

$$\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(6\, i \sqrt{2}$$

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

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

$$\Bigg(\text{EllipticE}\Big[i\, \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[i\, \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(i \sqrt{2}$$

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

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

$$\Bigg(\text{EllipticE}\Big[i\, \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\;\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(8\,i\,\sqrt{2}\right.$$

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

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

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

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

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

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

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

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

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(4\,\mathbb{i}\sqrt{2}\,a b c e^3\right.$$

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

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

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}} \Bigg) +$$

$$\Bigg(8 i \sqrt{2} c^3 d^2 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

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

$$\text{EllipticF}\Big[i \text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big]\Bigg) \Big/$$

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

$$\Bigg(8 i \sqrt{2} b c^2 d e \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

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

$$\text{EllipticF}\Big[i \text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\Big], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\Big]\Bigg) \Big/$$

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

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

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

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

$$\left(10 i \sqrt{2}\, a c^2 e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

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

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

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

Problem 2450: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 515 leaves, 7 steps):

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

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Bigg/$$

$$\left(5 c e^4\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\sqrt{a+b x+c x^2}\right)-$$

$$\left(16\sqrt{2}\sqrt{b^2-4 a c}\,(2 c d-b e)\left(c d^2-b d e+a e^2\right)\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\right.$$

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

$$\left(5 c e^4\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 3427 leaves):

$$\frac{\sqrt{d+e x}\,\left(a+x\,(b+c x)\right)^{3/2}\left(\frac{2\,(-3 c d+2 b e)}{5 e^3}+\frac{2 c x}{5 e^2}-\frac{2\left(c d^2-b d e+a e^2\right)}{e^3\,(d+e x)}\right)}{a+b x+c x^2}+$$

$$\frac{1}{5\,e^5\,\left(a+b\,x+c\,x^2\right)^{3/2}}\,\left(a+x\,\left(b+c\,x\right)\right)^{3/2}\,\left(\left(2\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2+12\,a\,c\,e^2\right)\right.\right.$$

$$\left.\left(d+e\,x\right)^{3/2}\,\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/$$

$$\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\left(\left(4\,i\,\sqrt{2}\,c^2\,d^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\;\Bigg)-\Bigg(4\,\mathbb{i}\,\sqrt{2}$$

$$b\,c\,d\,e\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\;\Bigg)+$$

$$\Bigg(\mathbb{i}\,b^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\;\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\Bigg(3\,\mathrm{i}\sqrt{2}\,a c e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\Bigg(8\,\mathrm{i}\sqrt{2}\,c^2 d\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(4\,i\,\sqrt{2}\,b\,c\,e\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)$$

Problem 2451: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{\left(d+e\,x\right)^{5/2}}\,dx$$

Optimal (type 4, 499 leaves, 7 steps):

$$\frac{2\left(8 c d-3 b e+2 c e x\right)\sqrt{a+b x+c x^2}}{3 e^3\sqrt{d+e x}}-\frac{2\left(a+b x+c x^2\right)^{3/2}}{3 e\left(d+e x\right)^{3/2}}-$$

$$\left(8\sqrt{2}\sqrt{b^2-4 a c}\left(2 c d-b e\right)\sqrt{d+e x}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\; e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(3 e^4\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{a+b x+c x^2}\right)+$$

$$\left(2\sqrt{2}\sqrt{b^2-4 a c}\left(16 c^2 d^2+3 b^2 e^2-4 c e\left(4 b d-a e\right)\right)\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\right.$$

$$\left.\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\; e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(3 c e^4\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5751 leaves):

$$\frac{\sqrt{d+e x}\left(a+x\left(b+c x\right)\right)^{3/2}\left(\frac{2 c}{3 e^3}-\frac{2\left(c d^2-b d e+a e^2\right)}{3 e^3\left(d+e x\right)^2}+\frac{8\left(2 c d-b e\right)}{3 e^3\left(d+e x\right)}\right)}{a+b x+c x^2}-$$

$$\frac{1}{3 e^5\left(a+b x+c x^2\right)^{3/2}}\,2\left(a+x\left(b+c x\right)\right)^{3/2}$$

$$\left(\left(8\,(2\,c\,d-b\,e)\,(d+e\,x)^{3/2}\left(c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/\right.$$

$$\left(\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-\left(4\,i\,\sqrt{2}\,c^2\,d^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\right.$$

$$(d+e\,x)\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left((c\,d^2-b\,d\,e+a\,e^2)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(6\,\mathrm{i}\,\sqrt{2}\,b\,c\,d^2\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)\right.$$

$$\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\left(2\,\mathrm{i}\,\sqrt{2}\,b^2\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(4 i\sqrt{2}\, a c d e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)+$$

$$\left(2 i \sqrt{2}\, a b e^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(8\,\mathrm{i}\sqrt{2}\,c^2 d^2(d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\;b\,c\,d\,e\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\left(3\,\mathrm{i}\,b^2\,e^2\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\text{i} \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(2\,\text{i}\sqrt{2}\,a c e^2(d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\,\right)\right)$$

Problem 2452: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,x+c\,x^2\right)^{3/2}}{(d+e\,x)^{7/2}}\,dx$$

Optimal (type 4, 578 leaves, 7 steps):

$$-\left(\left(2\left(8c^2d^3+a\,b\,e^3-c\,d\,e\left(7\,b\,d-4\,a\,e\right)+e\left(10\,c^2d^2+b^2e^2-2\,c\,e\left(5\,b\,d-3\,a\,e\right)\right)x\right)\sqrt{a+b\,x+c\,x^2}\right)\Big/\left(5\,e^3\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(d+e\,x\right)^{3/2}\right)\right)-\frac{2\left(a+b\,x+c\,x^2\right)^{3/2}}{5\,e\left(d+e\,x\right)^{5/2}}+$$

$$\left(\sqrt{2}\sqrt{b^2-4\,a\,c}\left(16\,c^2d^2+b^2e^2-4\,c\,e\left(4\,b\,d-3\,a\,e\right)\right)\sqrt{d+e\,x}\sqrt{-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\;e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/$$

$$\left(5\,e^4\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{\frac{c\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(16\sqrt{2}\sqrt{b^2-4\,a\,c}\left(2\,c\,d-b\,e\right)\sqrt{\frac{c\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\sqrt{-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\right.\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\;e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/\left(5\,e^4\sqrt{d+e\,x}\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 3506 leaves):

$$\frac{1}{a+b\,x+c\,x^2}\sqrt{d+e\,x}\left(a+x\left(b+c\,x\right)\right)^{3/2}$$

$$\left(-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{5\,e^3\left(d+e\,x\right)^3}+\frac{4\left(2\,c\,d-b\,e\right)}{5\,e^3\left(d+e\,x\right)^2}-\frac{2\left(11\,c^2d^2-11\,b\,c\,d\,e+b^2e^2+7\,a\,c\,e^2\right)}{5\,e^3\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(d+e\,x\right)}\right)-$$

$$\frac{1}{5\,e^5\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(a+b\,x+c\,x^2\right)^{3/2}}$$

$$2\,c\,\left(a+x\,(b+c\,x)\right)^{3/2}\left(\left(\left(-16\,c^2\,d^2+16\,b\,c\,d\,e-b^2\,e^2-12\,a\,c\,e^2\right)\right.\right.$$

$$\left.\left.(d+e\,x)^{3/2}\left(c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\right/$$

$$\left(c\,\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+\frac{1}{c\,\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\left(\left(4\,\mathrm{i}\,\sqrt{2}\,c^2\,d^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\right/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-\Bigg(4\,\mathrm{i}\,\sqrt{2}$$

$$b\,c\,d\,e\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+$$

$$\Bigg(\mathrm{i}\,b^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\;\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(2\sqrt{2}\,\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\Bigg(3\,\mathrm{i}\,\sqrt{2}\,a c e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\Bigg[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Bigg]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\Bigg(8\,\mathrm{i}\,\sqrt{2}\,c^2 d\,\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) -$$

$$\left(4 i \sqrt{2}\, b c e \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2453: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x+c x^2\right)^{3/2}}{(d+e x)^{9/2}}\, dx$$

Optimal (type 4, 721 leaves, 8 steps):

$$\frac{4\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(b\,d-2\,a\,e)\right)\,\sqrt{a+b\,x+c\,x^2}}{35\,e^3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\sqrt{d+e\,x}}-$$

$$\left(2\,\left(8\,c^2\,d^3-c\,d\,e\,(5\,b\,d-4\,a\,e)-b\,e^2\,(2\,b\,d-3\,a\,e)+e\,\left(14\,c^2\,d^2+b^2\,e^2-2\,c\,e\,(7\,b\,d-5\,a\,e)\right)\,x\right)\right.$$

$$\left.\sqrt{a+b\,x+c\,x^2}\right)\Big/\left(35\,e^3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(d+e\,x)^{5/2}\right)-\frac{2\,\left(a+b\,x+c\,x^2\right)^{3/2}}{7\,e\,(d+e\,x)^{7/2}}-$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(b\,d-2\,a\,e)\right)\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(35\,e^4\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(16\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(4\,b\,d-5\,a\,e)\right)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\right.$$

$$\left.\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(35\,e^4\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 5469 leaves) :

$$\frac{1}{a+b\,x+c\,x^2}\sqrt{d+e\,x}\,\left(a+x\,(b+c\,x)\right)^{3/2}$$

$$\left(-\frac{2\left(c d^2-b d e+a e^2\right)}{7 e^3 (d+e x)^4}+\frac{16 (2 c d-b e)}{35 e^3 (d+e x)^3}-\frac{2\left(19 c^2 d^2-19 b c d e+b^2 e^2+15 a c e^2\right)}{35 e^3\left(c d^2-b d e+a e^2\right)(d+e x)^2}+\right.$$
$$\left.\frac{4(-2 c d+b e)\left(-4 c^2 d^2+4 b c d e+b^2 e^2-8 a c e^2\right)}{35 e^3\left(c d^2-b d e+a e^2\right)^2 (d+e x)}\right)+$$
$$\frac{1}{35 e^5\left(c d^2-b d e+a e^2\right)^2\left(a+b x+c x^2\right)^{3/2}} 2 c\,(a+x(b+c x))^{3/2}$$
$$\left(-\left(\left(2 (2 c d-b e)\left(4 c^2 d^2-4 b c d e-b^2 e^2+8 a c e^2\right)(d+e x)^{3/2}\right.\right.\right.$$
$$\left.\left.\left(c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/$$
$$\left.\left(c \sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)\right)+\frac{1}{c \sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$
$$\left(c d^2-b d e+a e^2\right)(d+e x) \sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$
$$\left(\left(4 i \sqrt{2}\, c^3 d^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.$$
$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$
$$\left(\text{EllipticE}\left[i \operatorname{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$
$$\text{EllipticF}\left[i \operatorname{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(6\,\mathrm{i}\,\sqrt{2}\right.$$

$$b\,c^2\,d^2\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(\mathrm{i}\,\sqrt{2}\right.$$

$$b^2\,c\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],$$

$$\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(8\,\mathbb{i}\,\sqrt{2}\right.$$

$$a\,c^2\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],$$

$$\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(\mathrm{i}\, b^3 e^3 \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2} \left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\right.$$

$$\left.\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) - \left(4\, \mathrm{i} \sqrt{2}\, a b c e^3\right.$$

$$\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\,c^3\,d^2\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\,b\,c^2\,d\,e\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(i\, b^2\, c\, e^2 \sqrt{1-\frac{2\left(c\, d^2-b\, d\, e+a\, e^2\right)}{\left(2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}\right)(d+e\, x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\, d^2-b\, d\, e+a\, e^2\right)}{\left(2\, c\, d-b\, e+\sqrt{b^2\, e^2-4\, a\, c\, e^2}\right)(d+e\, x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c\, d^2-b\, d\, e+a\, e^2}{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}}}{\sqrt{d+e\, x}}\right], \frac{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}{2\, c\, d-b\, e+\sqrt{b^2\, e^2-4\, a\, c\, e^2}}\right]\right) \Bigg/$$

$$\left(\sqrt{2}\sqrt{-\frac{c\, d^2-b\, d\, e+a\, e^2}{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}}\sqrt{c+\frac{c\, d^2-b\, d\, e+a\, e^2}{(d+e\, x)^2}+\frac{-2\, c\, d+b\, e}{d+e\, x}}\right)+$$

$$\left(10\, i\, \sqrt{2}\, a\, c^2\, e^2 \sqrt{1-\frac{2\left(c\, d^2-b\, d\, e+a\, e^2\right)}{\left(2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}\right)(d+e\, x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\, d^2-b\, d\, e+a\, e^2\right)}{\left(2\, c\, d-b\, e+\sqrt{b^2\, e^2-4\, a\, c\, e^2}\right)(d+e\, x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c\, d^2-b\, d\, e+a\, e^2}{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}}}{\sqrt{d+e\, x}}\right], \frac{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}{2\, c\, d-b\, e+\sqrt{b^2\, e^2-4\, a\, c\, e^2}}\right]\right) \Bigg/$$

$$\left.\left.\left(\sqrt{-\frac{c\, d^2-b\, d\, e+a\, e^2}{2\, c\, d-b\, e-\sqrt{b^2\, e^2-4\, a\, c\, e^2}}}\sqrt{c+\frac{c\, d^2-b\, d\, e+a\, e^2}{(d+e\, x)^2}+\frac{-2\, c\, d+b\, e}{d+e\, x}}\right)\right)\right)$$

Problem 2454: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{d\, x}\, \left(a+b\, x+c\, x^2\right)^{5/2} dx$$

Optimal (type 4, 616 leaves, 9 steps):

$$-\frac{4\left(24 b^6-268 a b^4 c+951 a^2 b^2 c^2-924 a^3 c^3\right) d x \sqrt{a+b x+c x^2}}{9009 c^{7/2} \sqrt{d x}\left(\sqrt{a}+\sqrt{c} x\right)}+\frac{1}{9009 c^3}$$

$$2 \sqrt{d x}\left(b\left(24 b^4-151 a b^2 c+108 a^2 c^2\right)+3 c\left(24 b^4-181 a b^2 c+308 a^2 c^2\right) x\right) \sqrt{a+b x+c x^2}-$$

$$\frac{10 \sqrt{d x}\left(3 b\left(6 b^2-19 a c\right)+14 c\left(3 b^2-11 a c\right) x\right)\left(a+b x+c x^2\right)^{3/2}}{9009 c^2}+$$

$$\frac{10 b \sqrt{d x}\left(a+b x+c x^2\right)^{5/2}}{143 c}+\frac{2(d x)^{3/2}\left(a+b x+c x^2\right)^{5/2}}{13 d}+$$

$$\left(4 a^{1/4}\left(24 b^6-268 a b^4 c+951 a^2 b^2 c^2-924 a^3 c^3\right) d \sqrt{x}\left(\sqrt{a}+\sqrt{c} x\right) \sqrt{\frac{a+b x+c x^2}{\left(\sqrt{a}+\sqrt{c} x\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(9009 c^{15/4} \sqrt{d x} \sqrt{a+b x+c x^2}\right)-$$

$$\left(a^{1/4}\left(\sqrt{a} b \sqrt{c}\left(24 b^4-241 a b^2 c+708 a^2 c^2\right)+2\left(24 b^6-268 a b^4 c+951 a^2 b^2 c^2-924 a^3 c^3\right)\right)\right.$$

$$\left.d \sqrt{x}\left(\sqrt{a}+\sqrt{c} x\right) \sqrt{\frac{a+b x+c x^2}{\left(\sqrt{a}+\sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/$$

$$\left(9009 c^{15/4} \sqrt{d x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 708 leaves) :

$$\frac{1}{9009\,c^4\,\sqrt{x}\,\sqrt{a+x\,(b+c\,x)}}$$
$$\sqrt{d\,x}\,\Bigg(-\frac{4\,(24\,b^6-268\,a\,b^4\,c+951\,a^2\,b^2\,c^2-924\,a^3\,c^3)\,(a+x\,(b+c\,x))}{\sqrt{x}}+2\,c\,\sqrt{x}\,(a+x\,(b+c\,x))$$
$$(24\,b^5-18\,b^4\,c\,x+b^3\,c\,(-241\,a+15\,c\,x^2)+3\,b^2\,c^2\,x\,(54\,a+371\,c\,x^2)+77\,c^3\,x\,(31\,a^2+28\,a\,c\,x^2+9\,c^2\,x^4)+b\,c^2\,(708\,a^2+3071\,a\,c\,x^2+1701\,c^2\,x^4))+$$
$$\frac{1}{\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}\,\mathrm{i}\,(24\,b^6-268\,a\,b^4\,c+951\,a^2\,b^2\,c^2-924\,a^3\,c^3)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)$$
$$\sqrt{2+\frac{4\,a}{\left(b+\sqrt{b^2-4\,a\,c}\right)\,x}}\,\sqrt{\frac{2\,a+b\,x-\sqrt{b^2-4\,a\,c}\,x}{b\,x-\sqrt{b^2-4\,a\,c}\,x}}$$
$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}{\sqrt{x}}\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]+\frac{1}{\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}$$
$$\mathrm{i}\,\Big(24\,b^7-292\,a\,b^5\,c+1192\,a^2\,b^3\,c^2-1632\,a^3\,b\,c^3-24\,b^6\,\sqrt{b^2-4\,a\,c}+268\,a\,b^4\,c\,\sqrt{b^2-4\,a\,c}-$$
$$951\,a^2\,b^2\,c^2\,\sqrt{b^2-4\,a\,c}+924\,a^3\,c^3\,\sqrt{b^2-4\,a\,c}\Big)\,\sqrt{2+\frac{4\,a}{\left(b+\sqrt{b^2-4\,a\,c}\right)\,x}}$$
$$\sqrt{\frac{2\,a+b\,x-\sqrt{b^2-4\,a\,c}\,x}{b\,x-\sqrt{b^2-4\,a\,c}\,x}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{a}{b+\sqrt{b^2-4\,a\,c}}}}{\sqrt{x}}\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]\Bigg)$$

Problem 2455: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,x+c\,x^2)^{5/2}}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 847 leaves, 8 steps):

$$\frac{1}{693\,c^2\,e^5}2\,\sqrt{d+e\,x}\,\big(128\,c^4\,d^4-4\,b^4\,e^4-4\,c^3\,d^2\,e\,(76\,b\,d-69\,a\,e)-b^2\,c\,e^3\,(7\,b\,d-27\,a\,e)+$$
$$3\,c^2\,e^2\,(65\,b^2\,d^2-124\,a\,b\,d\,e+60\,a^2\,e^2)-12\,c\,e\,(2\,c\,d-b\,e)\,(4\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(b\,d-2\,a\,e))\,x\big)$$
$$\sqrt{a+b\,x+c\,x^2}+\frac{1}{693\,c\,e^3}10\,\sqrt{d+e\,x}\,\left(16\,c^2\,d^2+3\,b^2\,e^2-c\,e\,(23\,b\,d-18\,a\,e)-7\,c\,e\,(2\,c\,d-b\,e)\,x\right)$$

$$\left(a+b\,x+c\,x^2\right)^{3/2}+\frac{2\,\sqrt{d+e\,x}\,\left(a+b\,x+c\,x^2\right)^{5/2}}{11\,e}-$$

$$\left(\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(2\,c\,d-b\,e\right)\,\left(128\,c^4\,d^4+8\,b^4\,e^4+b^2\,c\,e^3\,\left(29\,b\,d-93\,a\,e\right)-4\,c^3\,d^2\,e\,\left(64\,b\,d-93\,a\,e\right)+\right.\right.$$

$$\left.3\,c^2\,e^2\,\left(33\,b^2\,d^2-124\,a\,b\,d\,e+124\,a^2\,e^2\right)\right)\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(693\,c^3\,e^6\,\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(4\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(128\,c^4\,d^4+2\,b^4\,e^4-4\,c^3\,d^2\,e\,\left(64\,b\,d-69\,a\,e\right)+\right.\right.$$

$$\left.b^2\,c\,e^3\,\left(5\,b\,d-21\,a\,e\right)+3\,c^2\,e^2\,\left(41\,b^2\,d^2-92\,a\,b\,d\,e+60\,a^2\,e^2\right)\right)\,\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}$$

$$\left.\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(693\,c^3\,e^6\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 10 879 leaves) :

$$\frac{1}{\left(a+b\,x+c\,x^2\right)^2}\sqrt{d+e\,x}\,\left(\frac{1}{693\,c^2\,e^5}2\,\left(128\,c^4\,d^4-304\,b\,c^3\,d^3\,e+195\,b^2\,c^2\,d^2\,e^2+356\,a\,c^3\,d^2\,e^2-7\,b^3\,c\,d\,e^3-487\,a\,b\,c^2\,d\,e^3-4\,b^4\,e^4+42\,a\,b^2\,c\,e^4+333\,a^2\,c^2\,e^4\right)+\frac{1}{693\,c\,e^4}2\,\left(-96\,c^3\,d^3+224\,b\,c^2\,d^2\,e-139\,b^2\,c\,d\,e^2-262\,a\,c^2\,d\,e^2+3\,b^3\,e^3+347\,a\,b\,c\,e^3\right)\,x+\frac{2\,\left(80\,c^2\,d^2-185\,b\,c\,d\,e+113\,b^2\,e^2+216\,a\,c\,e^2\right)\,x^2}{693\,e^3}+\frac{2\,c\,\left(-10\,c\,d+23\,b\,e\right)\,x^3}{99\,e^2}+\frac{2\,c^2\,x^4}{11\,e}\right)$$

$$\left(a+x\,\left(b+c\,x\right)\right)^{5/2}-\frac{1}{693\,c^2\,e^7\,\left(a+b\,x+c\,x^2\right)^{5/2}}$$

$$2\,\left(a+x\,\left(b+c\,x\right)\right)^{5/2}\left(\left(\left(2\,c\,d-b\,e\right)\,\left(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+99\,b^2\,c^2\,d^2\,e^2+372\,a\,c^3\,d^2\,e^2+29\,b^3\,c\,d\,e^3-372\,a\,b\,c^2\,d\,e^3+8\,b^4\,e^4-93\,a\,b^2\,c\,e^4+372\,a^2\,c^2\,e^4\right)\right.\right.$$

$$\left.\left(d+e\,x\right)^{3/2}\,\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/$$

$$\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\,\left(\left(64\,\mathrm{i}\right.\right.$$

$$\sqrt{2}\,c^5\,d^5\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\text{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(160\,\text{i}\sqrt{2}\,b c^4 d^4 e$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\text{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\text{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(227\,\text{i}\,b^2$$

$$c^3 d^3 e^2 \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[\mathbb{i} \, \text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \text{EllipticF}\left[\mathbb{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2} \left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\right.$$

$$\left.\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) + \left(186 \, \mathbb{i} \sqrt{2} \, a c^4 d^3 e^2\right.$$

$$\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\text{EllipticF}\left[\mathbb{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-\Bigg(41\,\mathbb{i}\,b^3$$

$$c^2\,d^2\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\;\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\;\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\left.\left.\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\;\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\right)\right)\Bigg/$$

$$\Bigg(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-\Bigg(279\,\mathbb{i}\,\sqrt{2}\,a\,b\,c^3\,d^2\,e^3$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(13\,\mathbb{i}\right.$$

$$b^4\,c\,d\,e^4\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\text{EllipticF}\left[\mathbb{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\right.$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+\Bigg(93\,\mathrm{i}\,a\,b^2\,c^2\,d\,e^4$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\,(c\,d^2-b\,d\,e+a\,e^2)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+\Bigg(186\,\mathrm{i}\,\sqrt{2}\,a^2\,c^3\,d\,e^4$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(2\,\mathbb{i}\right.$$

$$\sqrt{2}\, b^5 e^5\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(93\,\mathbb{i}\right.$$

$$a b^3 c e^5\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(93 i\sqrt{2}\, a^2 b c^2 e^5\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\Bigg(128\,\mathrm{i}\,\sqrt{2}\,c^5 d^4\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\Bigg(256\,\mathrm{i}\,\sqrt{2}\,b c^4 d^3 e\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\Bigg(123\,\mathrm{i}\,\sqrt{2}\,b^2 c^3 d^2 e^2\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(276\,\mathrm{i}\sqrt{2}\,a c^4 d^2 e^2\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(5\,\mathrm{i}\sqrt{2}\,b^3 c^2 d e^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) -$$

$$\left(276 i \sqrt{2} a b c^3 d e^3 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) +$$

$$\left(2 i \sqrt{2} b^4 c e^4 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) -$$

$$\left(21 i \sqrt{2} a b^2 c^2 e^4 \sqrt{1 - \frac{2 (c d^2 - b d e + a e^2)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[\text{i ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(180\,\text{i}\sqrt{2}\,a^2 c^3 e^4\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[\text{i ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

$$\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)$$

Problem 2456: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b x+c x^2\right)^{5/2}}{(d+e x)^{3/2}}\,dx$$

Optimal (type 4, 716 leaves, 8 steps):

$$-\frac{1}{63\,c\,e^5}2\sqrt{d+e\,x}\,\Big(128\,c^3\,d^3-b^3\,e^3+3\,b\,c\,e^2\,(37\,b\,d-36\,a\,e)-12\,c^2\,d\,e\,(20\,b\,d-11\,a\,e)-3\,c\,e\,\big(32\,c^2\,d^2+b^2\,e^2-4\,c\,e\,(8\,b\,d-7\,a\,e)\big)\,x\Big)\sqrt{a+b\,x+c\,x^2}-\frac{10\,\sqrt{d+e\,x}\,(16\,c\,d-15\,b\,e-14\,c\,e\,x)\,\left(a+b\,x+c\,x^2\right)^{3/2}}{63\,e^3}-\frac{2\,\left(a+b\,x+c\,x^2\right)^{5/2}}{e\,\sqrt{d+e\,x}}+$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\Big(128\,c^4\,d^4-b^4\,e^4-4\,c^3\,d^2\,e\,(64\,b\,d-57\,a\,e)-b^2\,c\,e^3\,(7\,b\,d-15\,a\,e)+3\,c^2\,e^2\,\left(45\,b^2\,d^2-76\,a\,b\,d\,e+28\,a^2\,e^2\right)\Big)\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/$$

$$\left(63\,c^2\,e^6\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,(2\,c\,d-b\,e)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(128\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(32\,b\,d-33\,a\,e)\right)\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/\left(63\,c^2\,e^6\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 7946 leaves) :

$$\frac{1}{\left(a+b\,x+c\,x^2\right)^2}\sqrt{d+e\,x}\;\left(a+x\,\left(b+c\,x\right)\right)^{5/2}$$

$$\Bigg(\frac{1}{63\,c\,e^5}2\,\left(-65\,c^3\,d^3+114\,b\,c^2\,d^2\,e-48\,b^2\,c\,d\,e^2-86\,a\,c^2\,d\,e^2+b^3\,e^3+57\,a\,b\,c\,e^3\right)+$$

$$\frac{2\,\left(33\,c^2\,d^2-50\,b\,c\,d\,e+15\,b^2\,e^2+28\,a\,c\,e^2\right)\,x}{63\,e^4}+$$

$$\frac{2\,c\,\left(-17\,c\,d+19\,b\,e\right)\,x^2}{63\,e^3}+\frac{2\,c^2\,x^3}{9\,e^2}-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}{e^5\,\left(d+e\,x\right)}\Bigg)-$$

$$\frac{1}{63\,c\,e^7\,\left(a+b\,x+c\,x^2\right)^{5/2}}\,2\,\left(a+x\,\left(b+c\,x\right)\right)^{5/2}\Bigg(-\Bigg(\Bigg(2\,\left(128\,c^4\,d^4-256\,b\,c^3\,d^3\,e+135\,b^2\,c^2\,d^2\,e^2+\right.$$

$$\left.228\,a\,c^3\,d^2\,e^2-7\,b^3\,c\,d\,e^3-228\,a\,b\,c^2\,d\,e^3-b^4\,e^4+15\,a\,b^2\,c\,e^4+84\,a^2\,c^2\,e^4\right)$$

$$\left(d+e\,x\right)^{3/2}\,\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\Bigg)\Bigg/$$

$$\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\Bigg)+\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\;\Bigg(\Bigg(64\,\mathrm{i}$$

$$\sqrt{2}\;c^4\,d^4\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\;\Bigg(\mathtt{EllipticE}\Big[\mathrm{i}\;\mathtt{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\;\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\;\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\mathtt{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Bigg]\Bigg)\Bigg) \Bigg/$$

$$\left((c d^2-b d e+a e^2)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) - \Bigg(128\, i \sqrt{2}\, b c^3 d^3 e$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2 (c d^2-b d e+a e^2)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2 (c d^2-b d e+a e^2)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right] -\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg) \Bigg/ \Bigg((c d^2-b d e+a e^2)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg) + \Bigg(135\, i\, b^2$$

$$c^2 d^2 e^2 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2 (c d^2-b d e+a e^2)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\Bigg(114\, i \sqrt{2}\, a c^3 d^2 e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-$$

$$\Bigg(7\, i\, b^3 c d e^3 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \Bigg(\text{EllipticE}\Big[i\, \text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[i$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\left(c d^2-b d e+a e^2\right) \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(114\, i \sqrt{2}\, a b c^2 d e^3$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[i\, \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(\mathrm{i}\, b^4 e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(15\,\mathrm{i}\, a b^2 c e^4\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\Bigg(42\,\mathrm{i}\sqrt{2}\,a^2 c^2 e^4$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/\Big(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+$$

$$\Bigg(128\,\mathrm{i}\,\sqrt{2}\,c^4\,d^3\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\Bigg(192\,\mathrm{i}\,\sqrt{2}\,b\,c^3\,d^2\,e\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\Bigg(63\,\mathrm{i}\,\sqrt{2}\,b^2\,c^2\,d\,e^2\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(132\,\mathbb{i}\sqrt{2}\,a c^3 d e^2\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(\mathbb{i}\,b^3 c e^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(66\,\mathrm{i}\,\sqrt{2}\,a\,b\,c^2\,e^3\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\Bigg)\Bigg)$$

Problem 2457: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,x+c\,x^2\right)^{5/2}}{\left(d+e\,x\right)^{5/2}}\,dx$$

Optimal (type 4, 622 leaves, 8 steps):

$$\frac{1}{21 e^5} 2 \sqrt{d+e x} \left(128 c^2 d^2+51 b^2 e^2-4 c e (44 b d-5 a e)-48 c e (2 c d-b e) x\right) \sqrt{a+b x+c x^2}+\frac{10 (16 c d-7 b e+2 c e x) \left(a+b x+c x^2\right)^{3/2}}{21 e^3 \sqrt{d+e x}}-\frac{2 \left(a+b x+c x^2\right)^{5/2}}{3 e (d+e x)^{3/2}}-\left(\sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \left(128 c^2 d^2+3 b^2 e^2-4 c e (32 b d-29 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/ \left(21 c e^6 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)+\left(4 \sqrt{2} \sqrt{b^2-4 a c} \left(c d^2-b d e+a e^2\right) \left(128 c^2 d^2+27 b^2 e^2-4 c e (32 b d-5 a e)\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/ \left(21 c e^6 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5407 leaves) :

$$\frac{1}{\left(a+b x+c x^2\right)^2}$$

$$\sqrt{d+e x}\ \left(a+x\ (b+c\ x)\right)^{5/2}\left(\frac{2\ \left(37\ c^2\ d^2-43\ b\ c\ d\ e+9\ b^2\ e^2+16\ a\ c\ e^2\right)}{21\ e^5}+\frac{2\ c\ (-4\ c\ d+3\ b\ e)\ x}{7\ e^4}+\frac{2\ c^2\ x^2}{7\ e^3}-\frac{2\ \left(c\ d^2-b\ d\ e+a\ e^2\right)^2}{3\ e^5\ (d+e\ x)^2}-\frac{14\ (-2\ c\ d+b\ e)\ \left(c\ d^2-b\ d\ e+a\ e^2\right)}{3\ e^5\ (d+e\ x)}\right)-\frac{1}{21\ e^7\ \left(a+b\ x+c\ x^2\right)^{5/2}}$$

$$2\ \left(a+x\ (b+c\ x)\right)^{5/2}\left(\left((2\ c\ d-b\ e)\ \left(128\ c^2\ d^2-128\ b\ c\ d\ e+3\ b^2\ e^2+116\ a\ c\ e^2\right)\right.\right.$$

$$(d+e\ x)^{3/2}\left(c+\frac{c\ d^2}{(d+e\ x)^2}-\frac{b\ d\ e}{(d+e\ x)^2}+\frac{a\ e^2}{(d+e\ x)^2}-\frac{2\ c\ d}{d+e\ x}+\frac{b\ e}{d+e\ x}\right)\Bigg)\Bigg/$$

$$\left(c\sqrt{\frac{(d+e\ x)^2\left(c\left(-1+\frac{d}{d+e\ x}\right)^2+\frac{e\left(b-\frac{b\ d}{d+e\ x}+\frac{a\ e}{d+e\ x}\right)}{d+e\ x}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{(d+e\ x)^2\left(c\left(-1+\frac{d}{d+e\ x}\right)^2+\frac{e\left(b-\frac{b\ d}{d+e\ x}+\frac{a\ e}{d+e\ x}\right)}{d+e\ x}\right)}{e^2}}}$$

$$\left(c\ d^2-b\ d\ e+a\ e^2\right)\ (d+e\ x)\ \sqrt{c+\frac{c\ d^2}{(d+e\ x)^2}-\frac{b\ d\ e}{(d+e\ x)^2}+\frac{a\ e^2}{(d+e\ x)^2}-\frac{2\ c\ d}{d+e\ x}+\frac{b\ e}{d+e\ x}}\ \left(\left(64\ \mathrm{i}\right.\right.$$

$$\sqrt{2}\ c^3\ d^3\ \left(2\ c\ d-b\ e+\sqrt{b^2\ e^2-4\ a\ c\ e^2}\right)\ \sqrt{1-\frac{2\ \left(c\ d^2-b\ d\ e+a\ e^2\right)}{\left(2\ c\ d-b\ e-\sqrt{b^2\ e^2-4\ a\ c\ e^2}\right)\ (d+e\ x)}}$$

$$\sqrt{1-\frac{2\ \left(c\ d^2-b\ d\ e+a\ e^2\right)}{\left(2\ c\ d-b\ e+\sqrt{b^2\ e^2-4\ a\ c\ e^2}\right)\ (d+e\ x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\ \text{ArcSinh}\left[\frac{\sqrt{2}\ \sqrt{-\frac{c\ d^2-b\ d\ e+a\ e^2}{2\ c\ d-b\ e-\sqrt{b^2\ e^2-4\ a\ c\ e^2}}}}{\sqrt{d+e\ x}}\right],\ \frac{2\ c\ d-b\ e-\sqrt{b^2\ e^2-4\ a\ c\ e^2}}{2\ c\ d-b\ e+\sqrt{b^2\ e^2-4\ a\ c\ e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\ \text{ArcSinh}\left[\frac{\sqrt{2}\ \sqrt{-\frac{c\ d^2-b\ d\ e+a\ e^2}{2\ c\ d-b\ e-\sqrt{b^2\ e^2-4\ a\ c\ e^2}}}}{\sqrt{d+e\ x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2 - b d e + a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\ \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) - \left(96\, i \sqrt{2}\right.$$

$$b c^2 d^2 e \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2 - b d e + a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\ \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) + \left(67\, i\right.$$

$$b^2 c d e^2 \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\ \left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+\Bigg(58\,\mathrm{i}\,\sqrt{2}\,a\,c^2\,d\,e^2$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\ \sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-$$

$$\left(3\,\mathrm{i}\,b^3\,e^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(29\,\mathrm{i}\,\sqrt{2}\,a\,b\,c\,e^3\right.$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(128 \, i \sqrt{2} \, c^3 d^2 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(128 \, i \sqrt{2} \, b c^2 d e \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(27\,i\,\sqrt{2}\,b^2\,c\,e^2\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(20\,i\,\sqrt{2}\,a\,c^2\,e^2\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2458: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{5/2}}{(d+e\,x)^{7/2}}\,dx$$

Optimal (type 4, 603 leaves, 8 steps):

$$-\frac{1}{15 e^5 \sqrt{d+e x}} 2 \left(128 c^2 d^2+15 b^2 e^2-4 c e (28 b d-9 a e)+16 c e (2 c d-b e) x\right) \sqrt{a+b x+c x^2}+\frac{2 (16 c d-5 b e+6 c e x) \left(a+b x+c x^2\right)^{3/2}}{15 e^3 (d+e x)^{3/2}}-\frac{2 \left(a+b x+c x^2\right)^{5/2}}{5 e (d+e x)^{5/2}}+$$

$$\left(2 \sqrt{2} \sqrt{b^2-4 a c} \left(128 c^2 d^2+23 b^2 e^2-4 c e (32 b d-9 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/$$

$$\left(15 e^6 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)-$$

$$\left(2 \sqrt{2} \sqrt{b^2-4 a c}\, (2 c d-b e) \left(128 c^2 d^2+15 b^2 e^2-4 c e (32 b d-17 a e)\right)\right.$$

$$\sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],\right.$$

$$\left.\left.-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/\left(15 c e^6 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 8961 leaves):

$$\frac{1}{\left(a+b x+c x^2\right)^2}\sqrt{d+e x}\,\left(a+x\,(b+c x)\right)^{5/2}$$
$$\left(\frac{2 c\,(-19 c d+11 b e)}{15 e^5}+\frac{2 c^2 x}{5 e^4}-\frac{2\left(c d^2-b d e+a e^2\right)^2}{5 e^5\,(d+e x)^3}-\frac{22\,(-2 c d+b e)\left(c d^2-b d e+a e^2\right)}{15 e^5\,(d+e x)^2}-\right.$$
$$\left.\frac{2\left(128 c^2 d^2-128 b c d e+23 b^2 e^2+36 a c e^2\right)}{15 e^5\,(d+e x)}\right)-\frac{1}{15 e^7\left(a+b x+c x^2\right)^{5/2}}\,2\,\left(a+x\,(b+c x)\right)^{5/2}$$
$$\left(-\left(\left(2\left(128 c^2 d^2-128 b c d e+23 b^2 e^2+36 a c e^2\right)(d+e x)^{3/2}\left(c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\right.\right.\right.\right.$$
$$\left.\left.\left.\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/\left(\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)\right)+$$
$$\left(64\,\mathrm{i}\,\sqrt{2}\,c^3 d^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$
$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$
$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$
$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$
$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$
$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(128\, i \sqrt{2}\, b c^2 d^3 e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)+$$

$$\Bigg(151\,\mathrm{i}\,b^2 c\,d^2 e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)+$$

$$\left(82\,i\,\sqrt{2}\,a\,c^2\,d^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)\right.$$

$$\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\left(23\,i\,b^3\,d\,e^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(82\,\mathbb{i}\sqrt{2}\,a b c d e^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)+$$

$$\left(23\,\mathrm{i}\,a b^2 e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)+$$

$$\left(18\,i\sqrt{2}\,a^2 c e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\right.$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(128\,\text{i}\,\sqrt{2}\,c^3\,d^3\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\left(192\,\mathrm{i}\,\sqrt{2}\,b\,c^2\,d^2\,e\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(79\,\mathrm{i}\,\sqrt{2}\,b^2\,c\,d\,e^2\,(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)+$$

$$\left(68\,i\sqrt{2}\,a c^2 d e^2(d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\Bigg(15\,i\,b^3 e^3 (d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}$$

$$\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)-$$

$$\Bigg(34\,i\sqrt{2}\,a b c e^3 (d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\Bigg)$$

Problem 2459: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{5/2}}{(d+e\,x)^{9/2}}\,dx$$

Optimal (type 4, 731 leaves, 8 steps):

$$\left(2 c \left(128 c^2 d^3-4 c d e (44 b d-29 a e)+3 b e^2 (17 b d-16 a e)+e \left(32 c^2 d^2+3 b^2 e^2-4 c e (8 b d-5 a e)\right) x\right) \sqrt{a+b x+c x^2}\right) \Big/ \left(21 e^5 \left(c d^2-b d e+a e^2\right) \sqrt{d+e x}\right)-$$
$$\left(2 \left(16 c^2 d^3+3 a b e^3-c d e (13 b d-4 a e)+e \left(22 c^2 d^2+3 b^2 e^2-2 c e (11 b d-5 a e)\right) x\right) \left(a+b x+c x^2\right)^{3/2}\right) \Big/ \left(21 e^3 \left(c d^2-b d e+a e^2\right) (d+e x)^{5/2}\right)-\frac{2 \left(a+b x+c x^2\right)^{5/2}}{7 e (d+e x)^{7/2}}-$$
$$\left(\sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \left(128 c^2 d^2+3 b^2 e^2-4 c e (32 b d-29 a e)\right) \sqrt{d+e x}\right.$$
$$\left.\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Big/$$
$$\left(21 e^6 \left(c d^2-b d e+a e^2\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)+$$
$$\left(4 \sqrt{2} \sqrt{b^2-4 a c} \left(128 c^2 d^2+27 b^2 e^2-4 c e (32 b d-5 a e)\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\right.$$
$$\left.\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Big/$$
$$\left(21 e^6 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5482 leaves):

$$\frac{1}{\left(a+b x+c x^2\right)^2} \sqrt{d+e x}\, (a+x (b+c x))^{5/2} \left(\frac{2 c^2}{3 e^5}-\frac{2 \left(c d^2-b d e+a e^2\right)^2}{7 e^5 (d+e x)^4}-\right.$$

$$\frac{6\left(-2 c d+b e\right)\left(c d^2-b d e+a e^2\right)}{7 e^5\left(d+e x\right)^3}-\frac{2\left(52 c^2 d^2-52 b c d e+9 b^2 e^2+16 a c e^2\right)}{21 e^5\left(d+e x\right)^2}-$$

$$\left.\frac{2\left(-2 c d+b e\right)\left(79 c^2 d^2-79 b c d e+3 b^2 e^2+67 a c e^2\right)}{21 e^5\left(c d^2-b d e+a e^2\right)\left(d+e x\right)}\right)-$$

$$\frac{1}{21 e^7\left(c d^2-b d e+a e^2\right)\left(a+b x+c x^2\right)^{5/2}} 2 c\left(a+x\left(b+c x\right)\right)^{5/2}$$

$$\left(\left(\left(2 c d-b e\right)\left(128 c^2 d^2-128 b c d e+3 b^2 e^2+116 a c e^2\right)\left(d+e x\right)^{3/2}\right.\right.$$

$$\left.\left.\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\right/$$

$$\left(c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right)\left(d+e x\right)\sqrt{c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\left(\left(64 i\right.\right.$$

$$\sqrt{2} c^3 d^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(96\,\mathbb{i}\,\sqrt{2}\right.$$

$$b\,c^2\,d^2\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(67\,\mathbb{i}\right.$$

$$b^2\,c\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\,\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(58\,\mathrm{i}\sqrt{2}\,a c^2 d e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-$$

$$\left(3\,i\,b^3\,e^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(29\,i\,\sqrt{2}\,a\,b\,c\,e^3\right.$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right) \Big/ \left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(128\,\mathrm{i}\,\sqrt{2}\;c^3\,d^2\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\;\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(128\,\mathrm{i}\,\sqrt{2}\;b\,c^2\,d\,e\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\;\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(27 i \sqrt{2}\, b^2 c\, e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(20 i \sqrt{2}\, a c^2 e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2460: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x+c x^2\right)^{5/2}}{(d+e x)^{11/2}}\, dx$$

Optimal (type 4, 923 leaves, 8 steps):

$$-\left(\left(2\left(128 c^4 d^5-2 a b^3 e^5-4 c^3 d^3 e\,(60 b d-49 a e)-b c e^3\,(b^2 d^2+9 a b d e-24 a^2 e^2)+3 c^2 d e^2\,(37 b^2 d^2-52 a b d e+12 a^2 e^2)+e\left(160 c^4 d^4-2 b^4 e^4-4 c^3 d^2 e\,(80 b d-69 a e)-b^2 c e^3\,(11 b d-27 a e)+3 c^2 e^2\,(57 b^2 d^2-92 a b d e+28 a^2 e^2)\right) x\right)\sqrt{a+b x+c x^2}\right)\Big/\left(63 e^5\,(c d^2-b d e+a e^2)^2\,(d+e x)^{3/2}\right)\right)-$$

$$\left(2\left(16 c^2 d^3-b e^2\,(2 b d-5 a e)-c d e\,(11 b d-4 a e)+e\left(26 c^2 d^2+3 b^2 e^2-2 c e\,(13 b d-7 a e)\right) x\right)(a+b x+c x^2)^{3/2}\right)\Big/\left(63 e^3\,(c d^2-b d e+a e^2)\,(d+e x)^{7/2}\right)-$$

$$\frac{2\,(a+b x+c x^2)^{5/2}}{9 e\,(d+e x)^{9/2}}+$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4 a c}\,\left(128 c^4 d^4-b^4 e^4-4 c^3 d^2 e\,(64 b d-57 a e)-b^2 c e^3\,(7 b d-15 a e)+3 c^2 e^2\,(45 b^2 d^2-76 a b d e+28 a^2 e^2)\right)\sqrt{d+e x}\,\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\;e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(63 e^6\,(c d^2-b d e+a e^2)^2\,\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{a+b x+c x^2}\right)-$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4 a c}\,(2 c d-b e)\,\left(128 c^2 d^2-b^2 e^2-4 c e\,(32 b d-33 a e)\right)\right.$$

$$\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}}}{\sqrt{2}}\right], -\frac{2\sqrt{b^2-4ac}\;e}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}\right]\Bigg) \Bigg/$$

$$\left(63 e^6 \left(c d^2-b d e+a e^2\right) \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 8108 leaves):

$$\frac{1}{\left(a+bx+cx^2\right)^2}\sqrt{d+ex}\left(a+x\left(b+cx\right)\right)^{5/2}\left(-\frac{2\left(cd^2-bde+ae^2\right)^2}{9e^5\left(d+ex\right)^5}-\right.$$

$$\frac{38\left(-2cd+be\right)\left(cd^2-bde+ae^2\right)}{63e^5\left(d+ex\right)^4}-\frac{2\left(88c^2d^2-88bcde+15b^2e^2+28ace^2\right)}{63e^5\left(d+ex\right)^3}-$$

$$\frac{2\left(-2cd+be\right)\left(61c^2d^2-61bcde+b^2e^2+57ace^2\right)}{63e^5\left(cd^2-bde+ae^2\right)\left(d+ex\right)^2}-$$

$$\left(2\left(193c^4d^4-386bc^3d^3e+207b^2c^2d^2e^2+330ac^3d^2e^2-14b^3cde^3-330abc^2de^3-\right.\right.$$

$$\left.\left.\left.2b^4e^4+30ab^2ce^4+105a^2c^2e^4\right)\right)\Big/\left(63e^5\left(cd^2-bde+ae^2\right)^2\left(d+ex\right)\right)\right)+$$

$$\frac{1}{63e^7\left(cd^2-bde+ae^2\right)^2\left(a+bx+cx^2\right)^{5/2}}\,2c\left(a+x\left(b+cx\right)\right)^{5/2}$$

$$\left(\left(2\left(128c^4d^4-256bc^3d^3e+135b^2c^2d^2e^2+228ac^3d^2e^2-\right.\right.\right.$$

$$\left.7b^3cde^3-228abc^2de^3-b^4e^4+15ab^2ce^4+84a^2c^2e^4\right)$$

$$\left.\left(d+ex\right)^{3/2}\left(c+\frac{cd^2}{(d+ex)^2}-\frac{bde}{(d+ex)^2}+\frac{ae^2}{(d+ex)^2}-\frac{2cd}{d+ex}+\frac{be}{d+ex}\right)\right)\Bigg/$$

$$\left(c\sqrt{\frac{(d+ex)^2\left(c\left(-1+\frac{d}{d+ex}\right)^2+\frac{e\left(b-\frac{bd}{d+ex}+\frac{ae}{d+ex}\right)}{d+ex}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{(d+ex)^2\left(c\left(-1+\frac{d}{d+ex}\right)^2+\frac{e\left(b-\frac{bd}{d+ex}+\frac{ae}{d+ex}\right)}{d+ex}\right)}{e^2}}}$$

$$\left(cd^2-bde+ae^2\right)\left(d+ex\right)\sqrt{c+\frac{cd^2}{(d+ex)^2}-\frac{bde}{(d+ex)^2}+\frac{ae^2}{(d+ex)^2}-\frac{2cd}{d+ex}+\frac{be}{d+ex}}\;\left(\left(64\,i\right.\right.$$

$$\sqrt{2}\, c^4 d^4 \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\right.$$

$$\left.\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) - \left(128\, i \sqrt{2}\, b c^3 d^3 e\right.$$

$$\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] -\right.$$

$$\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(135\, i\, b^2\right.$$

$$c^2 d^2 e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(114\, i\sqrt{2}\, a c^3 d^2 e^2\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],$$

$$\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(7\,\mathrm{i}\,b^3\,c\,d\,e^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(114\,\mathrm{i}\,\sqrt{2}\,a\,b\,c^2\,d\,e^3\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i} \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i} \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(\mathbb{i}\, b^4 e^4 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \left(\text{EllipticE}\left[\mathbb{i} \,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathbb{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(15 \mathrm{i} a b^2 c e^4\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(42 \mathrm{i}\sqrt{2}\, a^2 c^2 e^4\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(128\,i\sqrt{2}\,c^4 d^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(192\,i\sqrt{2}\,b c^3 d^2 e\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(63\,\text{i}\,\sqrt{2}\,b^2\,c^2\,d\,e^2\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(132\,\text{i}\,\sqrt{2}\,a\,c^3\,d\,e^2\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(i\, b^3\, c\, e^3 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) -$$

$$\left(66\, i \sqrt{2}\, a\, b\, c^2\, e^3 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2461: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(d+e x)^{7/2}}{\sqrt{a+b x+c x^2}}\, dx$$

Optimal (type 4, 600 leaves, 8 steps):

$$\frac{2 e \left(71 c^2 d^2+24 b^2 e^2-c e (71 b d+25 a e)\right) \sqrt{d+e x} \sqrt{a+b x+c x^2}}{105 c^3}+\frac{12 e (2 c d-b e) (d+e x)^{3/2} \sqrt{a+b x+c x^2}}{35 c^2}+\frac{2 e (d+e x)^{5/2} \sqrt{a+b x+c x^2}}{7 c}+$$

$$\left(8 \sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \left(11 c^2 d^2+6 b^2 e^2-c e (11 b d+13 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/ \left(105 c^4 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)-$$

$$\left(2 \sqrt{2} \sqrt{b^2-4 a c} \left(c d^2-b d e+a e^2\right) \left(71 c^2 d^2+24 b^2 e^2-c e (71 b d+25 a e)\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/ \left(105 c^4 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5340 leaves):

$$\frac{1}{\sqrt{a+x\,(b+c\,x)}}\sqrt{d+e\,x}\;\left(a+b\,x+c\,x^2\right)$$

$$\left(-\frac{2\,e\,\left(-122\,c^2\,d^2+89\,b\,c\,d\,e-24\,b^2\,e^2+25\,a\,c\,e^2\right)}{105\,c^3}-\frac{4\,e^2\,\left(-11\,c\,d+3\,b\,e\right)\,x}{35\,c^2}+\frac{2\,e^3\,x^2}{7\,c}\right)+$$

$$\frac{1}{105\,c^3\,e\,\sqrt{a+x\,(b+c\,x)}}\sqrt{a+b\,x+c\,x^2}$$

$$\left(\left(16\,\left(2\,c\,d-b\,e\right)\,\left(11\,c^2\,d^2-11\,b\,c\,d\,e+6\,b^2\,e^2-13\,a\,c\,e^2\right)\,\left(d+e\,x\right)^{3/2}\,\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\right.\right.\right.$$

$$\left.\left.\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Bigg/\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\frac{1}{c\,\sqrt{\frac{(d+e\,x)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\,2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)$$

$$\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\;\left(\left(44\,\mathrm{i}\,\sqrt{2}\,c^3\,d^3\right.\right.$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\;\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(66\,\mathbb{i}\,\sqrt{2}\right.$$

$$b\,c^2\,d^2\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(46\,\mathbb{i}\,\sqrt{2}\right.$$

$$b^2\,c\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(52 i \sqrt{2}\right.$$

$$a c^2 d e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-\Bigg(12\,i$$

$$\sqrt{2}\,b^3\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+\Bigg(26\,i\,\sqrt{2}$$

$$a\,b\,c\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\left[\text{i ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(71\, \text{i}\, c^3 d^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\text{i ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(71\, \text{i}\, b c^2 d e \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\text{i ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(12\,\mathrm{i}\,\sqrt{2}\,b^2\,c\,e^2\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(25\,\mathrm{i}\,a\,c^2\,e^2\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left.\left.\left(\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2462: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^{5/2}}{\sqrt{a+b x+c x^2}}\,dx$$

Optimal (type 4, 509 leaves, 7 steps):

$$\frac{8 e (2 c d-b e) \sqrt{d+e x} \sqrt{a+b x+c x^2}}{15 c^2}+\frac{2 e (d+e x)^{3/2} \sqrt{a+b x+c x^2}}{5 c}+$$

$$\left(\sqrt{2} \sqrt{b^2-4 a c} \left(23 c^2 d^2+8 b^2 e^2-c e (23 b d+9 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(15 c^3 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)-$$

$$\left(8 \sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \left(c d^2-b d e+a e^2\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\right.$$

$$\left.\sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(15 c^3 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 868 leaves):

$$\frac{\sqrt{d+e\,x}\,\left(-\frac{2\,e\,(-11\,c\,d+4\,b\,e)}{15\,c^2}+\frac{2\,e^2\,x}{5\,c}\right)\,\left(a+b\,x+c\,x^2\right)}{\sqrt{a+x\,(b+c\,x)}}+$$

$$\frac{1}{15\,c^3\,e\,\sqrt{a+x\,(b+c\,x)}\,\sqrt{\frac{(d+e\,x)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\,2\,(d+e\,x)^{3/2}\,\sqrt{a+b\,x+c\,x^2}$$

$$\left(\left(23\,c^2\,d^2+8\,b^2\,e^2-c\,e\,(23\,b\,d+9\,a\,e)\right)\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)-\right.$$

$$\frac{1}{2\,\sqrt{2}\,\sqrt{\frac{c\,d^2+e\,(-b\,d+a\,e)}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}\,\sqrt{d+e\,x}}\,i\,\sqrt{1-\frac{2\,\left(c\,d^2+e\,(-b\,d+a\,e)\right)}{\left(2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1+\frac{2\,\left(c\,d^2+e\,(-b\,d+a\,e)\right)}{\left(-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)\,(d+e\,x)}}$$

$$\left(\left(2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)\,\left(23\,c^2\,d^2+8\,b^2\,e^2-c\,e\,(23\,b\,d+9\,a\,e)\right)\,\text{EllipticE}\left[\right.\right.$$

$$i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c\,d^2-b\,d\,e+a\,e^2}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}}{\sqrt{d+e\,x}}\right],\,-\frac{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}{2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}\right]+\left(-30\,c^3\,d^3+\right.$$

$$8\,b^2\,e^2\,\left(b\,e-\sqrt{(b^2-4\,a\,c)\,e^2}\right)-c^2\,d\,\left(-45\,b\,d\,e-34\,a\,e^2+23\,d\,\sqrt{(b^2-4\,a\,c)\,e^2}\right)+$$

$$\left.c\,e\,\left(-31\,b^2\,d\,e-17\,a\,b\,e^2+23\,b\,d\,\sqrt{(b^2-4\,a\,c)\,e^2}+9\,a\,e\,\sqrt{(b^2-4\,a\,c)\,e^2}\right)\right)$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c\,d^2-b\,d\,e+a\,e^2}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}}{\sqrt{d+e\,x}}\right],\,-\frac{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}{2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}\right]\right)\right)$$

Problem 2463: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^{3/2}}{\sqrt{a+b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 439 leaves, 6 steps):

$$\frac{2 e \sqrt{d+e x} \sqrt{a+b x+c x^2}}{3 c}+\left(2 \sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/$$
$$\left(3 c^2 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)-$$
$$\left(2 \sqrt{2} \sqrt{b^2-4 a c} \left(c d^2-b d e+a e^2\right) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}} \text{EllipticF}\left[\right.\right.$$
$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c} e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/\left(3 c^2 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 735 leaves):

$$\frac{2 e \sqrt{d+e x}\,\left(a+b x+c x^2\right)}{3 c \sqrt{a+x\,(b+c x)}}+\frac{1}{3 c^2 e \sqrt{a+x\,(b+c x)}\,\sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$2\,(d+e x)^{3/2} \sqrt{a+b x+c x^2}\,\Bigg(2\,(2 c d-b e) \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)+$$

$$\frac{1}{\sqrt{2}\,\sqrt{\frac{c d^2+e\,(-b d+a e)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}\,\sqrt{d+e x}}\,\mathbb{i}\,\sqrt{1-\frac{2\left(c d^2+e\,(-b d+a e)\right)}{\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)(d+e x)}}$$

$$\sqrt{1+\frac{2\left(c d^2+e\,(-b d+a e)\right)}{\left(-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)(d+e x)}}$$

$$\Bigg((-2 c d+b e)\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)$$

$$\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right],\,-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\right]+$$

$$\left(3 c^2 d^2+b e\left(b e-\sqrt{\left(b^2-4 a c\right) e^2}\right)+c\left(-3 b d e-a e^2+2 d \sqrt{\left(b^2-4 a c\right) e^2}\right)\right)$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right],\,-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\right]\Bigg)\Bigg)$$

Problem 2464: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d+e x}}{\sqrt{a+b x+c x^2}}\,dx$$

Optimal (type 4, 188 leaves, 2 steps):

$$\left(\sqrt{2}\,\sqrt{b^2-4ac}\,\sqrt{d+ex}\,\sqrt{-\frac{c\,(a+bx+cx^2)}{b^2-4ac}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}}}{\sqrt{2}}\right],\,-\frac{2\sqrt{b^2-4ac}\,e}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}\right]\right)\Bigg/$$

$$\left(c\,\sqrt{\frac{c\,(d+ex)}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}}\,\sqrt{a+bx+cx^2}\right)$$

Result (type 4, 365 leaves) :

$$\left(i\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\sqrt{\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{-2cd+\left(b+\sqrt{b^2-4ac}\right)e}}\,\sqrt{1-\frac{2c\,(d+ex)}{2cd+\left(-b+\sqrt{b^2-4ac}\right)e}}\right.$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{-2cd+\left(b+\sqrt{b^2-4ac}\right)e}}\,\sqrt{d+ex}\right],\right.\right.$$

$$\left.\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2cd+\left(-b+\sqrt{b^2-4ac}\right)e}\right]-\text{EllipticF}\Big[$$

$$\left.\left.i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{-2cd+\left(b+\sqrt{b^2-4ac}\right)e}}\,\sqrt{d+ex}\right],\,\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2cd+\left(-b+\sqrt{b^2-4ac}\right)e}\right]\right)\right)\Bigg/$$

$$\left(\sqrt{2}\,c\,e\,\sqrt{\frac{c}{-2cd+\left(b+\sqrt{b^2-4ac}\right)e}}\,\sqrt{a+x\,(b+cx)}\right)$$

Problem 2465: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{d+ex}\,\sqrt{a+bx+cx^2}}\,dx$$

Optimal (type 4, 189 leaves, 2 steps) :

$$\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/\left(c\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 308 leaves):

$$\left(\mathrm{i}\,(d+e\,x)\,\sqrt{2-\frac{4\,\left(c\,d^2+e\,(-b\,d+a\,e)\right)}{\left(2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)(d+e\,x)}}\,\sqrt{1+\frac{2\,\left(c\,d^2+e\,(-b\,d+a\,e)\right)}{\left(-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}\right)(d+e\,x)}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{\frac{c\,d^2-b\,d\,e+a\,e^2}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}}{\sqrt{d+e\,x}}\right],-\frac{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}{2\,c\,d-b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}\right]\right)\Big/\left(e\,\sqrt{\frac{c\,d^2+e\,(-b\,d+a\,e)}{-2\,c\,d+b\,e+\sqrt{(b^2-4\,a\,c)\,e^2}}}\,\sqrt{a+x\,(b+c\,x)}\right)$$

Problem 2466: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(d+e\,x)^{3/2}\,\sqrt{a+b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 248 leaves, 4 steps):

$$-\frac{2\,e\,\sqrt{a+b\,x+c\,x^2}}{\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{d+e\,x}}+\left(\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{\frac{c\,\left(d+e\,x\right)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 408 leaves):

$$\left(-\frac{4\,e^2\,\left(a+x\,\left(b+c\,x\right)\right)}{\sqrt{d+e\,x}}+\left(\mathrm{i}\,\sqrt{2}\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\right.\right.$$

$$\sqrt{\frac{e\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{-2\,c\,d+\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{1-\frac{2\,c\,\left(d+e\,x\right)}{2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{-2\,c\,d+\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{d+e\,x}\right],\right.\right.$$

$$\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}{2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]-\text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{-2\,c\,d+\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{d+e\,x}\right],\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}{2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\right)\Bigg/$$

$$\left.\left(\sqrt{\frac{c}{-2\,c\,d+\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\right)\right)\Bigg/\left(2\,e\,\left(c\,d^2+e\,\left(-b\,d+a\,e\right)\right)\,\sqrt{a+x\,\left(b+c\,x\right)}\right)$$

Problem 2467: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(d+e\,x)^{5/2}\,\sqrt{a+b\,x+c\,x^2}}\,dx$$

Optimal (type 4, 523 leaves, 7 steps):

$$-\frac{2\,e\,\sqrt{a+b\,x+c\,x^2}}{3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(d+e\,x)^{3/2}}-\frac{4\,e\,(2\,c\,d-b\,e)\,\sqrt{a+b\,x+c\,x^2}}{3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\sqrt{d+e\,x}}+\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,(2\,c\,d-b\,e)\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 812 leaves):

$$\frac{\sqrt{d+e x}\,\left(a+b x+c x^2\right)\left(-\frac{2 e}{3\left(c d^2-b d e+a e^2\right)(d+e x)^2}+\frac{4 e(-2 c d+b e)}{3\left(c d^2-b d e+a e^2\right)^2(d+e x)}\right)}{\sqrt{a+x(b+c x)}}+$$

$$\left(2(d+e x)^{3/2}\sqrt{a+b x+c x^2}\left(2(2 c d-b e)\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)+\right.\right.$$

$$\frac{1}{\sqrt{2}\sqrt{\frac{c d^2+e(-b d+a e)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}\sqrt{d+e x}}\,i\,\sqrt{1-\frac{2\left(c d^2+e(-b d+a e)\right)}{\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)(d+e x)}}$$

$$\sqrt{1+\frac{2\left(c d^2+e(-b d+a e)\right)}{\left(-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)(d+e x)}}$$

$$\left((-2 c d+b e)\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right)\text{EllipticE}\left[\right.\right.$$

$$i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right],-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\Bigg]+\left(3 c^2 d^2+\right.$$

$$b e\left(b e-\sqrt{\left(b^2-4 a c\right) e^2}\right)+c\left(-3 b d e-a e^2+2 d\sqrt{\left(b^2-4 a c\right) e^2}\right)\Big)\,\text{EllipticF}\Big[$$

$$\left.\left.\left.i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right],-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\right]\right)\right)\right)\Bigg/$$

$$\left(3 e\left(c d^2-b d e+a e^2\right)^2\sqrt{a+x(b+c x)}\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)$$

Problem 2468: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{(d+e x)^{7/2}\sqrt{a+b x+c x^2}}\,dx$$

Optimal (type 4, 629 leaves, 8 steps):

$$-\frac{2 e \sqrt{a+b x+c x^2}}{5 \left(c d^2-b d e+a e^2\right) (d+e x)^{5/2}}-\frac{8 e (2 c d-b e) \sqrt{a+b x+c x^2}}{15 \left(c d^2-b d e+a e^2\right)^2 (d+e x)^{3/2}}-\frac{2 e \left(23 c^2 d^2+8 b^2 e^2-c e (23 b d+9 a e)\right) \sqrt{a+b x+c x^2}}{15 \left(c d^2-b d e+a e^2\right)^3 \sqrt{d+e x}}+$$

$$\left(\sqrt{2} \sqrt{b^2-4 a c} \left(23 c^2 d^2+8 b^2 e^2-c e (23 b d+9 a e)\right) \sqrt{d+e x} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(15 \left(c d^2-b d e+a e^2\right)^3 \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{a+b x+c x^2}\right)-$$

$$\left(8 \sqrt{2} \sqrt{b^2-4 a c} (2 c d-b e) \sqrt{\frac{c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}} \sqrt{-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(15 \left(c d^2-b d e+a e^2\right)^2 \sqrt{d+e x} \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 983 leaves):

$$\frac{1}{\sqrt{a+x (b+c x)}}$$

$$\sqrt{d+e x} \left(a+b x+c x^2\right) \left(-\frac{2 e}{5 \left(c d^2-b d e+a e^2\right) (d+e x)^3}+\frac{8 e (-2 c d+b e)}{15 \left(c d^2-b d e+a e^2\right)^2 (d+e x)^2}+\right.$$

$$\frac{2 e \left(-23 c^2 d^2+23 b c d e-8 b^2 e^2+9 a c e^2\right)}{15 \left(c d^2-b d e+a e^2\right)^3 (d+e x)}\Bigg) + \Bigg(2 (d+e x)^{3/2} \sqrt{a+b x+c x^2}$$

$$\Bigg(\left(23 c^2 d^2+8 b^2 e^2-c e (23 b d+9 a e)\right) \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right) -$$

$$\frac{1}{2 \sqrt{2} \sqrt{\frac{c d^2+e (-b d+a e)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}} \sqrt{d+e x}} \, \mathbb{i} \sqrt{1-\frac{2 \left(c d^2+e (-b d+a e)\right)}{\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right) (d+e x)}}$$

$$\sqrt{1+\frac{2 \left(c d^2+e (-b d+a e)\right)}{\left(-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}\right) (d+e x)}}$$

$$\Bigg(\left(2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}\right) \left(23 c^2 d^2+8 b^2 e^2-c e (23 b d+9 a e)\right)$$

$$\text{EllipticE}\left[\mathbb{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right], -\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\right] +$$

$$\Bigg(-30 c^3 d^3+8 b^2 e^2 \left(b e-\sqrt{\left(b^2-4 a c\right) e^2}\right) -$$

$$c^2 d \left(-45 b d e-34 a e^2+23 d \sqrt{\left(b^2-4 a c\right) e^2}\right) + c e$$

$$\left(-31 b^2 d e-17 a b e^2+23 b d \sqrt{\left(b^2-4 a c\right) e^2}+9 a e \sqrt{\left(b^2-4 a c\right) e^2}\right)\Bigg) \, \text{EllipticF}\Bigg[$$

$$\mathbb{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\right], -\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\Bigg]\Bigg)\Bigg)\Bigg) \Big/$$

$$\left(15 e \left(c d^2-b d e+a e^2\right)^3 \sqrt{a+x (b+c x)} \sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)$$

Problem 2469: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(d+e\,x)^{7/2}}{\left(a+b\,x+c\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 641 leaves, 8 steps):

$$-\frac{2\,(d+e\,x)^{5/2}\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{(b^2-4\,a\,c)\,\sqrt{a+b\,x+c\,x^2}}+$$

$$\frac{4\,e\,\left(3\,c^2\,d^2+2\,b^2\,e^2-c\,e\,(3\,b\,d+5\,a\,e)\right)\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}}{3\,c^2\,(b^2-4\,a\,c)}+$$

$$\frac{2\,e\,(2\,c\,d-b\,e)\,(d+e\,x)^{3/2}\,\sqrt{a+b\,x+c\,x^2}}{c\,(b^2-4\,a\,c)}+$$

$$\left(\sqrt{2}\,(2\,c\,d-b\,e)\,\left(3\,c^2\,d^2+8\,b^2\,e^2-c\,e\,(3\,b\,d+29\,a\,e)\right)\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,c^3\,\sqrt{b^2-4\,a\,c}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(4\,\sqrt{2}\,(c\,d^2-b\,d\,e+a\,e^2)\,\left(3\,c^2\,d^2+2\,b^2\,e^2-c\,e\,(3\,b\,d+5\,a\,e)\right)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\right.$$

$$\left.\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,c^3\,\sqrt{b^2-4\,a\,c}\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 5433 leaves):

$$\left(\sqrt{d+e\,x}\,(a+b\,x+c\,x^2)^2\right.$$

$$\left(\frac{2 e^3}{3 c^2}+\left(2 \left(b c^2 d^3-6 a c^2 d^2 e+3 a b c d e^2-a b^2 e^3+2 a^2 c e^3+2 c^3 d^3 x-3 b c^2 d^2 e x+3 b^2 c d e^2 x-6 a c^2 d e^2 x-b^3 e^3 x+3 a b c e^3 x\right)\right) \Big/ \left(c^2 \left(-b^2+4 a c\right) \left(a+b x+c x^2\right)\right)\right)\Big/$$

$$\left(a+x \left(b+c x\right)\right)^{3/2}+\frac{1}{3 c^2 \left(-b^2+4 a c\right) e \left(a+x \left(b+c x\right)\right)^{3/2}} 2 \left(a+b x+c x^2\right)^{3/2}$$

$$\left(-\left(\left(\left(2 c d-b e\right) \left(3 c^2 d^2-3 b c d e+8 b^2 e^2-29 a c e^2\right) \left(d+e x\right)^{3/2}\right.\right.\right.$$

$$\left.\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/$$

$$\left.\left(c \sqrt{\frac{\left(d+e x\right)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)\right)+\frac{1}{c \sqrt{\frac{\left(d+e x\right)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right) \left(d+e x\right) \sqrt{c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(3 i c^3 d^3 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) \left(d+e x\right)}}\right.\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \left(d+e x\right)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/ \left(\sqrt{2}\, \left(c d^2 - b d e + a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\, \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) -$$

$$\left(9 \, \mathbb{i}\, b c^2 d^2 e \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[\mathbb{i}\, \text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\, \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \text{EllipticF}\left[\mathbb{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(2 \sqrt{2}\, \left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\right.$$

$$\left.\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) + \left(19 \, \mathbb{i}\, b^2 c d e^2\right.$$

$$\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[\mathbb{i}\, \text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\ \sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\ \sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(2\,\sqrt{2}\ \left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\ \Bigg)-\Bigg(29\,\mathbb{i}\,a\,c^2\,d\,e^2$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\ \Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\ \sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\ \sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\ \left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\ \Bigg)-\Bigg(2\,\mathbb{i}\,\sqrt{2}\ b^3\,e^3$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(29\,i\,a\,b\,c\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Bigg/ \left(2 \sqrt{2}\, \left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\, \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(3 i \sqrt{2}\, c^3 d^2 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\, \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(3 i \sqrt{2}\, b c^2 d e \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\, \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(2\,i\,\sqrt{2}\,b^2\,c\,e^2\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(5\,i\,\sqrt{2}\,a\,c^2\,e^2\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2470: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(d+e\,x)^{5/2}}{\left(a+b\,x+c\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 533 leaves, 7 steps):

$$-\frac{2\,(d+e\,x)^{3/2}\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{\left(b^2-4\,a\,c\right)\sqrt{a+b\,x+c\,x^2}}+\frac{2\,e\,(2\,c\,d-b\,e)\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}}{c\,\left(b^2-4\,a\,c\right)}+$$

$$\left(2\,\sqrt{2}\,\left(c^2\,d^2+b^2\,e^2-c\,e\,(b\,d+3\,a\,e)\right)\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/$$

$$\left(c^2\,\sqrt{b^2-4\,a\,c}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(2\,\sqrt{2}\,(2\,c\,d-b\,e)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/$$

$$\left(c^2\,\sqrt{b^2-4\,a\,c}\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 3447 leaves):

$$\left(2\,\sqrt{d+e\,x}\,\left(b\,c\,d^2-4\,a\,c\,d\,e+a\,b\,e^2+2\,c^2\,d^2\,x-2\,b\,c\,d\,e\,x+b^2\,e^2\,x-2\,a\,c\,e^2\,x\right)\left(a+b\,x+c\,x^2\right)\right)\Big/$$

$$\left(c\,\left(-b^2+4\,a\,c\right)\left(a+x\,(b+c\,x)\right)^{3/2}\right)+$$

$$\frac{1}{c\left(-b^2+4 a c\right) e \left(a+x\left(b+c x\right)\right)^{3/2}} \left(a+b x+c x^2\right)^{3/2} \Bigg(-\Bigg(\Bigg(4\left(c^2 d^2-b c d e+b^2 e^2-3 a c e^2\right)$$

$$\left(d+e x\right)^{3/2}\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\Bigg)\Bigg/$$

$$\left(c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)\Bigg)+\frac{1}{c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$2\left(c d^2-b d e+a e^2\right)\left(d+e x\right)\sqrt{c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\Bigg(\Bigg(i c^2 d^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{2}\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{\left(d+e x\right)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-$$

$$\left(\mathbb{i}\, b\, c\, d\, e \left(2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) \sqrt{1 - \frac{2 \left(c\, d^2 - b\, d\, e + a\, e^2\right)}{\left(2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) (d + e\, x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c\, d^2 - b\, d\, e + a\, e^2\right)}{\left(2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) (d + e\, x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c\, d^2 - b\, d\, e + a\, e^2}{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}}}{\sqrt{d + e\, x}}\right], \frac{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}{2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}\right] - \right.$$

$$\text{EllipticF}\left[\mathbb{i}\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c\, d^2 - b\, d\, e + a\, e^2}{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}}}{\sqrt{d + e\, x}}\right],\right.$$

$$\left.\left.\left.\frac{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}{2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}\right]\right)\right) \Big/ \left(\sqrt{2}\, \left(c\, d^2 - b\, d\, e + a\, e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\, d^2 - b\, d\, e + a\, e^2}{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}}\, \sqrt{c + \frac{c\, d^2 - b\, d\, e + a\, e^2}{(d + e\, x)^2} + \frac{-2\, c\, d + b\, e}{d + e\, x}}\right) +$$

$$\left(\mathbb{i}\, b^2 e^2 \left(2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) \sqrt{1 - \frac{2 \left(c\, d^2 - b\, d\, e + a\, e^2\right)}{\left(2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) (d + e\, x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c\, d^2 - b\, d\, e + a\, e^2\right)}{\left(2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}\right) (d + e\, x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c\, d^2 - b\, d\, e + a\, e^2}{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}}}{\sqrt{d + e\, x}}\right], \frac{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}{2\, c\, d - b\, e + \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}\right] - \right.$$

$$\text{EllipticF}\left[\mathbb{i}\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c\, d^2 - b\, d\, e + a\, e^2}{2\, c\, d - b\, e - \sqrt{b^2 e^2 - 4\, a\, c\, e^2}}}}{\sqrt{d + e\, x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\sqrt{2}\, \left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\, \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(3\, i\, a c e^2 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\, \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\sqrt{2}\, \left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\, \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(i \sqrt{2}\, c^2 d \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(i\,b\,c\,e\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg/$$

$$\left.\left(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)$$

Problem 2471: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^{3/2}}{\left(a+b x+c x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 457 leaves, 6 steps):

$$-\frac{2\sqrt{d+e x}\,\left(b d-2 a e+(2 c d-b e) x\right)}{\left(b^2-4 a c\right)\sqrt{a+b x+c x^2}}+\left(\sqrt{2}\,(2 c d-b e)\sqrt{d+e x}\,\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\bigg/$$

$$\left(c\sqrt{b^2-4 a c}\,\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{a+b x+c x^2}\right)-$$

$$\left(4\sqrt{2}\,\left(c d^2-b d e+a e^2\right)\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\bigg/$$

$$\left(c\sqrt{b^2-4 a c}\,\sqrt{d+e x}\,\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 600 leaves) :

$$\frac{1}{2\left(b^2-4ac\right)\sqrt{a+x\,(b+c\,x)}}\left(-\frac{4e\,(-2cd+be)\,(a+x\,(b+cx))}{c\sqrt{d+ex}}-4\sqrt{d+ex}\,\left(-2ae+2cdx+b\,(d-ex)\right)-\right.$$

$$\frac{1}{c\,e\sqrt{\frac{cd^2+e\,(-bd+ae)}{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}}}\,\mathrm{i}\,(d+ex)\sqrt{1-\frac{2\left(cd^2+e\,(-bd+ae)\right)}{\left(2cd-be+\sqrt{\left(b^2-4ac\right)e^2}\right)(d+ex)}}$$

$$\sqrt{2+\frac{4\left(cd^2+e\,(-bd+ae)\right)}{\left(-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}\right)(d+ex)}}\left(-(-2cd+be)\left(2cd-be+\sqrt{\left(b^2-4ac\right)e^2}\right)\right.$$

$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{\frac{cd^2-bde+ae^2}{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}}}{\sqrt{d+ex}}\right],-\frac{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}{2cd-be+\sqrt{\left(b^2-4ac\right)e^2}}\right]+$$

$$\left(-b^2e^2+4ace^2-2cd\sqrt{\left(b^2-4ac\right)e^2}+be\sqrt{\left(b^2-4ac\right)e^2}\right)$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{\frac{cd^2-bde+ae^2}{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}}}{\sqrt{d+ex}}\right],-\frac{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}{2cd-be+\sqrt{\left(b^2-4ac\right)e^2}}\right]\right)\right)$$

Problem 2472: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{d+ex}}{\left(a+bx+cx^2\right)^{3/2}}\,dx$$

Optimal (type 4, 426 leaves, 6 steps):

$$-\frac{2\left(b+2cx\right)\sqrt{d+ex}}{\left(b^2-4ac\right)\sqrt{a+bx+cx^2}}+\left(2\sqrt{2}\sqrt{d+ex}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4ac}\,e}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}\right]\right)\Big/$$

$$\left(\sqrt{b^2-4ac}\sqrt{\frac{c\left(d+ex\right)}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}}\sqrt{a+bx+cx^2}\right)-$$

$$\left(2\sqrt{2}\left(2cd-be\right)\sqrt{\frac{c\left(d+ex\right)}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}}\sqrt{-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4ac}\,e}{2cd-\left(b+\sqrt{b^2-4ac}\right)e}\right]\right)\Big/$$

$$\left(c\sqrt{b^2-4ac}\sqrt{d+ex}\sqrt{a+bx+cx^2}\right)$$

Result (type 4, 996 leaves) :

$$-\frac{2\left(b+2cx\right)\sqrt{d+ex}\left(a+bx+cx^2\right)}{\left(b^2-4ac\right)\left(a+x\left(b+cx\right)\right)^{3/2}}+$$

$$\left(\left(d+ex\right)^{3/2}\left(a+bx+cx^2\right)^{3/2}\left(-4\sqrt{\frac{cd^2+e\left(-bd+ae\right)}{-2cd+be+\sqrt{\left(b^2-4ac\right)e^2}}}\right.\right.$$

$$\left(c\left(-1+\frac{d}{d+ex}\right)^2+\frac{e\left(b-\frac{bd}{d+ex}+\frac{ae}{d+ex}\right)}{d+ex}\right)+\frac{1}{\sqrt{d+ex}}\,\mathrm{i}\,\sqrt{2}\left(2cd-be+\sqrt{\left(b^2-4ac\right)e^2}\right)$$

$$\sqrt{\frac{\sqrt{\left(b^2-4 a c\right) e^2}-\frac{2 a e^2}{d+e x}-2 c d\left(-1+\frac{d}{d+e x}\right)+b e\left(-1+\frac{2 d}{d+e x}\right)}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}}$$

$$\sqrt{\frac{\sqrt{\left(b^2-4 a c\right) e^2}+\frac{2 a e^2}{d+e x}+2 c d\left(-1+\frac{d}{d+e x}\right)+b\left(e-\frac{2 d e}{d+e x}\right)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}\ \text{EllipticE}\Big[$$

$$\mathrm{i}\ \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\Big],-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\Big]-\frac{1}{\sqrt{d+e x}}$$

$$\mathrm{i}\sqrt{2}\sqrt{\left(b^2-4 a c\right) e^2}\sqrt{\frac{\sqrt{\left(b^2-4 a c\right) e^2}-\frac{2 a e^2}{d+e x}-2 c d\left(-1+\frac{d}{d+e x}\right)+b e\left(-1+\frac{2 d}{d+e x}\right)}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}}$$

$$\sqrt{\frac{\sqrt{\left(b^2-4 a c\right) e^2}+\frac{2 a e^2}{d+e x}+2 c d\left(-1+\frac{d}{d+e x}\right)+b\left(e-\frac{2 d e}{d+e x}\right)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}$$

$$\text{EllipticF}\Big[\mathrm{i}\ \text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{\frac{c d^2-b d e+a e^2}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}}{\sqrt{d+e x}}\Big],-\frac{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}{2 c d-b e+\sqrt{\left(b^2-4 a c\right) e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\left(-b^2+4 a c\right) e\sqrt{\frac{c d^2+e\left(-b d+a e\right)}{-2 c d+b e+\sqrt{\left(b^2-4 a c\right) e^2}}}\left(a+x\left(b+c x\right)\right)^{3/2}$$

$$\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)$$

Problem 2473: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{d+e x}\left(a+b x+c x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 480 leaves, 6 steps):

$$-\frac{2\sqrt{d+e x}\,\left(b c d-b^2 e+2 a c e+c\,(2 c d-b e)\,x\right)}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)\sqrt{a+b x+c x^2}}+\left(\sqrt{2}\,(2 c d-b e)\sqrt{d+e x}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Big/$$

$$\left(\sqrt{b^2-4 a c}\,\left(c d^2-b d e+a e^2\right)\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\sqrt{a+b x+c x^2}\right)-$$

$$\left(4\sqrt{2}\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],\right.\right.$$

$$\left.\left.-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Big/\left(\sqrt{b^2-4 a c}\,\sqrt{d+e x}\,\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 1939 leaves):

$$\frac{2\sqrt{d+e x}\,\left(b c d-b^2 e+2 a c e+2 c^2 d x-b c e x\right)\left(a+b x+c x^2\right)}{\left(-b^2+4 a c\right)\left(c d^2-b d e+a e^2\right)\left(a+x\,(b+c x)\right)^{3/2}}-$$

$$\frac{1}{\left(-b^2+4 a c\right)e\left(c d^2-b d e+a e^2\right)\left(a+x\,(b+c x)\right)^{3/2}}\,2 c\left(a+b x+c x^2\right)^{3/2}$$

$$\left(\left((2 c d-b e)\,(d+e x)^{3/2}\left(c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/\right.$$

$$\left(c\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right)(d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(\left(\mathrm{i}\, c d\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(\mathrm{i}\, b e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],$$

$$\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(i\sqrt{2}\,c\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\Bigg)\Bigg)$$

Problem 2474: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(d+e x)^{3/2}\left(a+b x+c x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 607 leaves, 7 steps):

$$-\frac{2\left(b c d-b^2 e+2 a c e+c\left(2 c d-b e\right) x\right)}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)\sqrt{d+e x}\sqrt{a+b x+c x^2}}-\frac{4 e\left(c^2 d^2+b^2 e^2-c e\left(b d+3 a e\right)\right)\sqrt{a+b x+c x^2}}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)^2\sqrt{d+e x}}+$$

$$\left(2\sqrt{2}\left(c^2 d^2+b^2 e^2-c e\left(b d+3 a e\right)\right)\sqrt{d+e x}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/$$

$$\left(\sqrt{b^2-4 a c}\left(c d^2-b d e+a e^2\right)^2\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{a+b x+c x^2}\right)-$$

$$\left(2\sqrt{2}\left(2 c d-b e\right)\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Bigg/$$

$$\left(\sqrt{b^2-4 a c}\left(c d^2-b d e+a e^2\right)\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 3554 leaves):

$$\left(\sqrt{d+e x}\left(a+b x+c x^2\right)^2\left(-\frac{2 e^3}{\left(c d^2-b d e+a e^2\right)^2\left(d+e x\right)}-\right.\right.$$

$$\left(2\left(-b c^2 d^2+2 b^2 c d e-4 a c^2 d e-b^3 e^2+3 a b c e^2-2 c^3 d^2 x+2 b c^2 d e x-b^2 c e^2 x+\right.\right.$$

$$2 a c^2 e^2 x)\Big)\Big/\left(\left(-b^2+4 a c\right)\left(c d^2-b d e+a e^2\right)^2\left(a+b x+c x^2\right)\right)\Bigg)\Bigg/$$

$$\left(a+x\left(b+c x\right)\right)^{3/2}-\frac{1}{\left(-b^2+4 a c\right) e\left(c d^2-b d e+a e^2\right)^2\left(a+x\left(b+c x\right)\right)^{3/2}}$$

$$2 c\left(a+b x+c x^2\right)^{3/2}$$

$$\Bigg(\Bigg(2\left(c^2 d^2-b c d e+b^2 e^2-3 a c e^2\right)\left(d+e x\right)^{3/2}$$

$$\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\Bigg)\Bigg/$$

$$\left(c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right)\left(d+e x\right)\sqrt{c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\Bigg(\Bigg(\mathbb{i}\, c^2 d^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\Bigg(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(\mathrm{i}\,b\,c\,d\,e\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(\mathrm{i}\,b^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(3 i a c e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(i \sqrt{2}\, c^2 d \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) -$$

$$\left(i\, b c e \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2475: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(d+e x)^{5/2} \left(a+b x+c x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 744 leaves, 8 steps):

$$-\frac{2\left(b c d-b^2 e+2 a c e+c\left(2 c d-b e\right) x\right)}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)\left(d+e x\right)^{3/2}\sqrt{a+b x+c x^2}}-\frac{4 e\left(3 c^2 d^2+2 b^2 e^2-c e\left(3 b d+5 a e\right)\right)\sqrt{a+b x+c x^2}}{3\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)^2\left(d+e x\right)^{3/2}}-\frac{2 e\left(2 c d-b e\right)\left(3 c^2 d^2+8 b^2 e^2-c e\left(3 b d+29 a e\right)\right)\sqrt{a+b x+c x^2}}{3\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)^3\sqrt{d+e x}}+$$

$$\left(\sqrt{2}\left(2 c d-b e\right)\left(3 c^2 d^2+8 b^2 e^2-c e\left(3 b d+29 a e\right)\right)\sqrt{d+e x}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(3\sqrt{b^2-4 a c}\left(c d^2-b d e+a e^2\right)^3\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{a+b x+c x^2}\right)-$$

$$\left(4\sqrt{2}\left(3 c^2 d^2+2 b^2 e^2-c e\left(3 b d+5 a e\right)\right)\sqrt{\frac{c\left(d+e x\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(3\sqrt{b^2-4 a c}\left(c d^2-b d e+a e^2\right)^2\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5565 leaves):

$$\left(\sqrt{d+e\,x}\;\left(a+b\,x+c\,x^2\right)^2\left(-\frac{2\,e^3}{3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\left(d+e\,x\right)^2}+\frac{10\,e^3\,\left(-2\,c\,d+b\,e\right)}{3\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,\left(d+e\,x\right)}-\left(2\,\left(-b\,c^3\,d^3+3\,b^2\,c^2\,d^2\,e-6\,a\,c^3\,d^2\,e-3\,b^3\,c\,d\,e^2+9\,a\,b\,c^2\,d\,e^2+b^4\,e^3-4\,a\,b^2\,c\,e^3+2\,a^2\,c^2\,e^3-2\,c^4\,d^3\,x+3\,b\,c^3\,d^2\,e\,x-3\,b^2\,c^2\,d\,e^2\,x+6\,a\,c^3\,d\,e^2\,x+b^3\,c\,e^3\,x-3\,a\,b\,c^2\,e^3\,x\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,\left(a+b\,x+c\,x^2\right)\right)\right)\right)\Big/\left(a+x\,\left(b+c\,x\right)\right)^{3/2}+$$

$$\frac{1}{3\,\left(-b^2+4\,a\,c\right)\,e\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,\left(a+x\,\left(b+c\,x\right)\right)^{3/2}}$$

$$2\,c\,\left(a+b\,x+c\,x^2\right)^{3/2}\left(-\left(\left(\left(2\,c\,d-b\,e\right)\,\left(3\,c^2\,d^2-3\,b\,c\,d\,e+8\,b^2\,e^2-29\,a\,c\,e^2\right)\,\left(d+e\,x\right)^{3/2}\right.\right.\right.$$

$$\left.\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/$$

$$\left.\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\right)+\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\left(\left(3\,\mathrm{i}\,c^3\,d^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\texttt{EllipticE}\left[\mathrm{i}\,\texttt{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\sqrt{2}\,\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(9\,i\,b c^2 d^2 e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\,\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\left.\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(19\,i\,b^2 c d e^2\right.$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/$$

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\Bigg(29\,i\,a c^2 d e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg)\Bigg/$$

$$\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)-\Bigg(2\,\mathrm{i}\,\sqrt{2}\,b^3\,e^3$$

$$\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c\,d^2-b\,d\,e+a\,e^2\right)$$

$$\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\Bigg)+$$

$$\Bigg(29\,\mathrm{i}\,a\,b\,c\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(3\,\text{i}\,\sqrt{2}\,c^3\,d^2\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(3\,\text{i}\,\sqrt{2}\,b\,c^2\,d\,e\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(2 \mathrm{i} \sqrt{2} b^2 c e^2 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i} \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(5 \mathrm{i} \sqrt{2} a c^2 e^2 \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i} \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2476: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(d+e\,x)^{7/2}}{\left(a+b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 659 leaves, 7 steps):

$$-\frac{2\,(d+e\,x)^{5/2}\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{3\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^{3/2}}+\left(2\,\sqrt{d+e\,x}\,\left(8\,b\,c\,d\,\left(c\,d^2+3\,a\,e^2\right)-4\,a\,c\,e\,\left(3\,c\,d^2+5\,a\,e^2\right)-b^2\,\left(9\,c\,d^2\,e-a\,e^3\right)+(2\,c\,d-b\,e)\,\left(8\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(2\,b\,d-3\,a\,e)\right)\,x\right)\right)\Big/\left(3\,c\,\left(b^2-4\,a\,c\right)^2\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(2\,\sqrt{2}\,(2\,c\,d-b\,e)\,\left(4\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(b\,d-2\,a\,e)\right)\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/\left(3\,c^2\,\left(b^2-4\,a\,c\right)^{3/2}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(2\,\sqrt{2}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(16\,c^2\,d^2-b^2\,e^2-4\,c\,e\,(4\,b\,d-5\,a\,e)\right)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/\left(3\,c^2\,\left(b^2-4\,a\,c\right)^{3/2}\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 5598 leaves):

$$\left(\sqrt{d+e\,x}\,\left(a+b\,x+c\,x^2\right)^3\right.$$
$$\left(\left(2\,\left(b\,c^2\,d^3-6\,a\,c^2\,d^2\,e+3\,a\,b\,c\,d\,e^2-a\,b^2\,e^3+2\,a^2\,c\,e^3+2\,c^3\,d^3\,x-3\,b\,c^2\,d^2\,e\,x+3\,b^2\,c\,d\,e^2\,x-\right.\right.\right.$$

$$6\,a\,c^2\,d\,e^2\,x-b^3\,e^3\,x+3\,a\,b\,c\,e^3\,x\Big)\Big)\Big/\left(3\,c^2\,\left(-b^2+4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^2\right)+$$

$$\Big(2\,\Big(8\,b\,c^3\,d^3-13\,b^2\,c^2\,d^2\,e+4\,a\,c^3\,d^2\,e+3\,b^3\,c\,d\,e^2+12\,a\,b\,c^2\,d\,e^2-b^4\,e^3+7\,a\,b^2\,c\,e^3-28\,a^2\,c^2\,e^3+16\,c^4\,d^3\,x-24\,b\,c^3\,d^2\,e\,x+4\,b^2\,c^2\,d\,e^2\,x+32\,a\,c^3\,d\,e^2\,x+2\,b^3\,c\,e^3\,x-16\,a\,b\,c^2\,e^3\,x\Big)\Big)\Big/\left(3\,c^2\,\left(-b^2+4\,a\,c\right)^2\,\left(a+b\,x+c\,x^2\right)\right)\Big)\Big)\Big)\Big/$$

$$\left(a+x\,\left(b+c\,x\right)\right)^{5/2}+\frac{1}{3\,c\,\left(-b^2+4\,a\,c\right)^2\,e\,\left(a+x\,\left(b+c\,x\right)\right)^{5/2}}$$

$$\left(a+b\,x+c\,x^2\right)^{5/2}$$

$$\Bigg(-\Bigg(\Bigg(4\,\left(2\,c\,d-b\,e\right)\,\left(4\,c^2\,d^2-4\,b\,c\,d\,e-b^2\,e^2+8\,a\,c\,e^2\right)\,\left(d+e\,x\right)^{3/2}$$

$$\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\Bigg)\Bigg/$$

$$\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\Bigg)+\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\Bigg(\Bigg(\Bigg(4\,i\,\sqrt{2}\,c^3\,d^3\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(6 i \sqrt{2}\right.$$

$$b c^2 d^2 e \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(i \sqrt{2}\right.$$

$$b^2 c d e^2 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(8\,\mathbb{i}\,\sqrt{2}\right.$$

$$a c^2 d e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(i\, b^3 e^3 \left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\left.\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \text{EllipticF}\left[i\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2} \left(c d^2 - b d e + a e^2\right) \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}\right.$$

$$\left.\sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) - \left(4\, i \sqrt{2}\, a b c e^3\right.$$

$$\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] -\right.$$

$$\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d + e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2 - b d e + a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) +$$

$$\left(8 i \sqrt{2} c^3 d^2 \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) -$$

$$\left(8 i \sqrt{2} b c^2 d e \sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1 - \frac{2 \left(c d^2 - b d e + a e^2\right)}{\left(2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}$$

$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 c d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2 - b d e + a e^2}{2 c d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{c + \frac{c d^2 - b d e + a e^2}{(d + e x)^2} + \frac{-2 c d + b e}{d + e x}}\right) -$$

$$\left(\mathrm{i}\, b^2 c\, e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(10\, \mathrm{i} \sqrt{2}\, a\, c^2 e^2 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left.\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2477: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(d+e x)^{5/2}}{\left(a+b x+c x^2\right)^{5/2}}\, dx$$

Optimal (type 4, 590 leaves, 7 steps):

$$-\frac{2\,(d+e\,x)^{3/2}\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{3\,(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^{3/2}}-\left(2\,\sqrt{d+e\,x}\,\left(7\,b^2\,d\,e+4\,a\,c\,d\,e-8\,b\,(c\,d^2+a\,e^2)-(16\,c^2\,d^2+b^2\,e^2-4\,c\,e\,(4\,b\,d-3\,a\,e))\,x\right)\right)\Big/\left(3\,(b^2-4\,a\,c)^2\,\sqrt{a+b\,x+c\,x^2}\right)-$$

$$\left(\sqrt{2}\,(16\,c^2\,d^2+b^2\,e^2-4\,c\,e\,(4\,b\,d-3\,a\,e))\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(3\,c\,(b^2-4\,a\,c)^{3/2}\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(16\,\sqrt{2}\,(2\,c\,d-b\,e)\,(c\,d^2-b\,d\,e+a\,e^2)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/$$

$$\left(3\,c\,(b^2-4\,a\,c)^{3/2}\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 3577 leaves):

$$\left(\sqrt{d+e\,x}\,(a+b\,x+c\,x^2)\right)^3$$

$$\left(\left(2\,(b\,c\,d^2-4\,a\,c\,d\,e+a\,b\,e^2+2\,c^2\,d^2\,x-2\,b\,c\,d\,e\,x+b^2\,e^2\,x-2\,a\,c\,e^2\,x)\right)\Big/\left(3\,c\,(-b^2+4\,a\,c)\right.\right.$$

$$\left.\left.\left.\left.\left(a+b\,x+c\,x^2\right)^2\right)+\left(2\,\left(8\,b\,c^2\,d^2-9\,b^2\,c\,d\,e+4\,a\,c^2\,d\,e+b^3\,e^2+4\,a\,b\,c\,e^2+16\,c^3\,d^2\,x-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.16\,b\,c^2\,d\,e\,x+b^2\,c\,e^2\,x+12\,a\,c^2\,e^2\,x\right)\right)\Big/\left(3\,c\,\left(-b^2+4\,a\,c\right)^2\,\left(a+b\,x+c\,x^2\right)\right)\right)\right)\Big/$$

$$\left(a+x\,\left(b+c\,x\right)\right)^{5/2}+\frac{1}{3\,\left(-b^2+4\,a\,c\right)^2\,e\,\left(a+x\,\left(b+c\,x\right)\right)^{5/2}}$$

$$\left(a+b\,x+c\,x^2\right)^{5/2}$$

$$\left(-\left(\left(2\,\left(16\,c^2\,d^2-16\,b\,c\,d\,e+b^2\,e^2+12\,a\,c\,e^2\right)\,\left(d+e\,x\right)^{3/2}\right.\right.\right.$$

$$\left.\left.\left(c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Big/$$

$$\left.\left(c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)\right)+\frac{1}{c\,\sqrt{\frac{\left(d+e\,x\right)^2\,\left(c\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(d+e\,x\right)\,\sqrt{c+\frac{c\,d^2}{\left(d+e\,x\right)^2}-\frac{b\,d\,e}{\left(d+e\,x\right)^2}+\frac{a\,e^2}{\left(d+e\,x\right)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\left(\left(4\,\mathbb{i}\,\sqrt{2}\,c^2\,d^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(4\,\mathrm{i}\,\sqrt{2}\right.$$

$$b\,c\,d\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(\mathrm{i}\,b^2\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(3\,\mathrm{i}\sqrt{2}\ a c e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\,c^2\,d\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(4\,\mathrm{i}\,\sqrt{2}\,b\,c\,e\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2478: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(d+e\,x)^{3/2}}{\left(a+b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 542 leaves, 7 steps):

$$-\frac{2\sqrt{d+e x}\,\left(b d-2 a e+(2 c d-b e)\,x\right)}{3\,(b^2-4 a c)\,(a+b x+c x^2)^{3/2}}+\frac{2\sqrt{d+e x}\,\left(8 b c d-5 b^2 e+4 a c e+8 c\,(2 c d-b e)\,x\right)}{3\,(b^2-4 a c)^2\sqrt{a+b x+c x^2}}-\left(8\sqrt{2}\,(2 c d-b e)\sqrt{d+e x}\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Bigg/\left(3\,(b^2-4 a c)^{3/2}\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\sqrt{a+b x+c x^2}\right)+\left(2\sqrt{2}\,\left(16 c^2 d^2+3 b^2 e^2-4 c e\,(4 b d-a e)\right)\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}}\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Bigg/\left(3 c\,(b^2-4 a c)^{3/2}\sqrt{d+e x}\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5802 leaves):

$$\left(\sqrt{d+e x}\,(a+b x+c x^2)^3\left(\frac{2\,(-b d+2 a e-2 c d x+b e x)}{3\,(b^2-4 a c)\,(a+b x+c x^2)^2}-\frac{2\,(-8 b c d+5 b^2 e-4 a c e-16 c^2 d x+8 b c e x)}{3\,(b^2-4 a c)^2\,(a+b x+c x^2)}\right)\right)\Big/$$

$$\left(a+x\,(b+c\,x)\right)^{5/2}-\frac{1}{3\,\left(-b^2+4\,a\,c\right)^2\,e\,\left(a+x\,(b+c\,x)\right)^{5/2}}\,2\,\left(a+b\,x+c\,x^2\right)^{5/2}$$

$$\left(\left(8\,(2\,c\,d-b\,e)\,(d+e\,x)^{3/2}\left(c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\right)\Bigg/\right.$$

$$\left(\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-\left(4\,i\,\sqrt{2}\,c^2\,d^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\right.$$

$$(d+e\,x)\,\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg) +$$

$$\Bigg(6 \mathrm{i} \sqrt{2}\, b c d^2 e \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)$$

$$\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i} \,\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big] -$$

$$\text{EllipticF}\Big[\mathrm{i} \,\text{ArcSinh}\Big[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg) \Big/$$

$$\Bigg(\left(c d^2-b d e+a e^2\right) \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}$$

$$\sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg) -$$

$$\Bigg(2\,\mathrm{i}\,\sqrt{2}\,b^2\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)$$

$$\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg)\Big/$$

$$\Bigg((c\,d^2-b\,d\,e+a\,e^2)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}$$

$$\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\Bigg)-$$

$$\Bigg(4\,\mathrm{i}\,\sqrt{2}\,a\,c\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)$$

$$\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\ \sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right.$$

$$\left.\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(2\,\mathbb{i}\,\sqrt{2}\,a\,b\,e^3\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)\right.$$

$$\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right] -\right.$$

$$\left.\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right) -$$

$$\left(8 i \sqrt{2}\, c^2 d^2 (d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)+$$

$$\left(8 i \sqrt{2} b c d e (d+e x) \sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2 \left(c \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(3 i b^2 e^2 (d+e x) \sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right.$$

$$\left.\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(2\,\mathrm{i}\sqrt{2}\,a c e^2(d+e x)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\Bigg(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}$$

$$\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\;\Bigg)\Bigg)$$

Problem 2479: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{d+e\,x}}{\left(a+b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 605 leaves, 7 steps) :

$$-\frac{2\,(b+2\,c\,x)\,\sqrt{d+e\,x}}{3\,(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^{3/2}}-\Big(2\,\sqrt{d+e\,x}\,\big(9\,b^2\,c\,d\,e-4\,a\,c^2\,d\,e-b^3\,e^2-4\,b\,c\,(2\,c\,d^2+a\,e^2)-c\,(16\,c^2\,d^2+b^2\,e^2-4\,c\,e\,(4\,b\,d-3\,a\,e))\,x\big)\Big)\Big/\Big(3\,(b^2-4\,a\,c)^2\,(c\,d^2-b\,d\,e+a\,e^2)\,\sqrt{a+b\,x+c\,x^2}\Big)-$$

$$\left(\sqrt{2}\,(16\,c^2\,d^2+b^2\,e^2-4\,c\,e\,(4\,b\,d-3\,a\,e))\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,(b^2-4\,a\,c)^{3/2}\,(c\,d^2-b\,d\,e+a\,e^2)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{a+b\,x+c\,x^2}\right)+$$

$$\left(16\,\sqrt{2}\,(2\,c\,d-b\,e)\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Bigg/$$

$$\left(3\,(b^2-4\,a\,c)^{3/2}\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\right)$$

Result (type 4, 3560 leaves):

$$\left(\sqrt{d+e\,x}\,(a+b\,x+c\,x^2)^3\left(-\frac{2\,(b+2\,c\,x)}{3\,(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^2}+\right.\right.$$

$$\big(2\,\big(8\,b\,c^2\,d^2-9\,b^2\,c\,d\,e+4\,a\,c^2\,d\,e+b^3\,e^2+4\,a\,b\,c\,e^2+16\,c^3\,d^2\,x-16\,b\,c^2\,d\,e\,x+b^2\,c\,e^2\,x+$$

$$12\,a\,c^2\,e^2\,x\Big)\Big)\Big/\left(3\left(-b^2+4\,a\,c\right)^2\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(a+b\,x+c\,x^2\right)\right)\Bigg)\Bigg)\Bigg/$$

$$\left(a+x\,(b+c\,x)\right)^{5/2}+\frac{1}{3\left(-b^2+4\,a\,c\right)^2 e\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(a+x\,(b+c\,x)\right)^{5/2}}$$

$$2\,c\,\left(a+b\,x+c\,x^2\right)^{5/2}$$

$$\Bigg(\Bigg(\left(-16\,c^2\,d^2+16\,b\,c\,d\,e-b^2\,e^2-12\,a\,c\,e^2\right)\left(d+e\,x\right)^{3/2}$$

$$\left(c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\Bigg)\Bigg/$$

$$\left(c\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+\frac{1}{c\sqrt{\frac{(d+e\,x)^2\left(c\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{a\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}$$

$$\left(c\,d^2-b\,d\,e+a\,e^2\right)\left(d+e\,x\right)\sqrt{c+\frac{c\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{a\,e^2}{(d+e\,x)^2}-\frac{2\,c\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\Bigg(\Bigg(4\,i\,\sqrt{2}\,c^2\,d^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\left(d+e\,x\right)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\ \frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(4\,\mathrm{i}\,\sqrt{2}\right.$$

$$b\,c\,d\,e\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{\left(d+e\,x\right)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(\mathrm{i}\,b^2\,e^2\,\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\right.$$

$$\sqrt{1-\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,\left(d+e\,x\right)}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{\left(d+e x\right)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(3\,\mathbb{i}\sqrt{2}\;a c e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{\left(d+e x\right)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\left(8\,i\,\sqrt{2}\,c^2\,d\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(4\,i\,\sqrt{2}\,b\,c\,e\,\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2480: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{d+e\,x}\,\left(a+b\,x+c\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 725 leaves, 7 steps):

$$-\frac{2\sqrt{d+e x}\,\left(b c d-b^2 e+2 a c e+c\,(2 c d-b e)\,x\right)}{3\,(b^2-4 a c)\,(c d^2-b d e+a e^2)\,(a+b x+c x^2)^{3/2}}-$$
$$\left(2\sqrt{d+e x}\,\left(3 a c e\,(2 c d-b e)^2-(b c d-b^2 e+2 a c e)\,(8 c^2 d^2-2 b^2 e^2-5 c e\,(b d-2 a e))-2 c\,(2 c d-b e)\,(4 c^2 d^2-b^2 e^2-4 c e\,(b d-2 a e))\,x\right)\right)\Big/$$
$$\left(3\,(b^2-4 a c)^2\,(c d^2-b d e+a e^2)^2\,\sqrt{a+b x+c x^2}\right)-$$
$$\left(2\sqrt{2}\,(2 c d-b e)\,(4 c^2 d^2-b^2 e^2-4 c e\,(b d-2 a e))\,\sqrt{d+e x}\,\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$
$$\left(3\,(b^2-4 a c)^{3/2}\,(c d^2-b d e+a e^2)^2\,\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{a+b x+c x^2}\right)+$$
$$\left(2\sqrt{2}\,(16 c^2 d^2-b^2 e^2-4 c e\,(4 b d-5 a e))\,\sqrt{\frac{c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}}\,\sqrt{-\frac{c\,(a+b x+c x^2)}{b^2-4 a c}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\,e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$
$$\left(3\,(b^2-4 a c)^{3/2}\,(c d^2-b d e+a e^2)\,\sqrt{d+e x}\,\sqrt{a+b x+c x^2}\right)$$

Result (type 4, 5566 leaves):

$$\left(\sqrt{d+e x}\,(a+b x+c x^2)^3\,\left(\frac{2\,(b c d-b^2 e+2 a c e+2 c^2 d x-b c e x)}{3\,(-b^2+4 a c)\,(c d^2-b d e+a e^2)\,(a+b x+c x^2)^2}+\right.\right.$$

$$\left(2\left(8 b c^3 d^3-13 b^2 c^2 d^2 e+4 a c^3 d^2 e+3 b^3 c d e^2+12 a b c^2 d e^2+2 b^4 e^3-17 a b^2 c e^3+20 a^2 c^2 e^3+16 c^4 d^3 x-24 b c^3 d^2 e x+4 b^2 c^2 d e^2 x+32 a c^3 d e^2 x+2 b^3 c e^3 x-16 a b c^2 e^3 x\right)\right)\Big/$$

$$\left(3\left(-b^2+4 a c\right)^2\left(c d^2-b d e+a e^2\right)^2\left(a+b x+c x^2\right)\right)\Bigg)\Bigg)\Big/\left(a+x\left(b+c x\right)\right)^{5/2}+$$

$$\frac{1}{3\left(-b^2+4 a c\right)^2 e\left(c d^2-b d e+a e^2\right)^2\left(a+x\left(b+c x\right)\right)^{5/2}}$$

$$2$$

$$c\left(a+b x+c x^2\right)^{5/2}$$

$$\left(-\left(\left(2\left(2 c d-b e\right)\left(4 c^2 d^2-4 b c d e-b^2 e^2+8 a c e^2\right)\left(d+e x\right)^{3/2}\right.\right.\right.$$

$$\left.\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/$$

$$\left.\left(c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)\right)+\frac{1}{c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right)\left(d+e x\right)\sqrt{c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(4\, \mathrm{i}\sqrt{2}\, c^3 d^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}\right.\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\left(d+e x\right)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-\left(6\,\text{i}\,\sqrt{2}\right.$$

$$b\,c^2\,d^2\,e\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\right.$$

$$\left.\left.\left.\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/\left(\left(c\,d^2-b\,d\,e+a\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+\left(\text{i}\,\sqrt{2}\right.$$

$$b^2\,c\,d\,e^2\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(c\,d^2-b\,d\,e+a\,e^2\right)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\text{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\text{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+\left(8 \text{i} \sqrt{2}\right.$$

$$a c^2 d e^2 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\text{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\text{i} \, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+$$

$$\Bigg(\mathrm{i}\, b^3 e^3 \left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \Bigg(\text{EllipticE}\Big[\mathrm{i}\, \text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\ \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\ \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\ \left(c d^2-b d e+a e^2\right) \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(4\, \mathrm{i}\, \sqrt{2}\ a b c e^3$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\sqrt{1-\frac{2 \left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[\mathrm{i}\, \text{ArcSinh}\Big[\frac{\sqrt{2}\ \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\,c^3 d^2\,\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(8\,\mathrm{i}\,\sqrt{2}\,b c^2 d e\,\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(i\,b^2\,c\,e^2\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(10\,i\,\sqrt{2}\,a\,c^2\,e^2\,\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\,(c\,d^2-b\,d\,e+a\,e^2)}{\left(2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,c\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{-\frac{c\,d^2-b\,d\,e+a\,e^2}{2\,c\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{c+\frac{c\,d^2-b\,d\,e+a\,e^2}{(d+e\,x)^2}+\frac{-2\,c\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 2481: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(d+e\,x)^{3/2}\,(a+b\,x+c\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 918 leaves, 8 steps):

$$-\frac{2\,(b\,c\,d-b^2\,e+2\,a\,c\,e+c\,(2\,c\,d-b\,e)\,x)}{3\,(b^2-4\,a\,c)\,(c\,d^2-b\,d\,e+a\,e^2)\,\sqrt{d+e\,x}\,(a+b\,x+c\,x^2)^{3/2}}-$$
$$\Big(2\,\big(5\,a\,c\,e\,(2\,c\,d-b\,e)^2-(b\,c\,d-b^2\,e+2\,a\,c\,e)\,(8\,c^2\,d^2-4\,b^2\,e^2-c\,e\,(3\,b\,d-14\,a\,e))-$$
$$4\,c\,(2\,c\,d-b\,e)\,(2\,c^2\,d^2-b^2\,e^2-2\,c\,e\,(b\,d-3\,a\,e))\,x\big)\Big)\Big/$$
$$\Big(3\,(b^2-4\,a\,c)^2\,(c\,d^2-b\,d\,e+a\,e^2)^2\,\sqrt{d+e\,x}\,\sqrt{a+b\,x+c\,x^2}\Big)+$$
$$\Big(2\,e\,(16\,c^4\,d^4-8\,b^4\,e^4-4\,c^3\,d^2\,e\,(8\,b\,d-15\,a\,e)+b^2\,c\,e^3\,(7\,b\,d+57\,a\,e)+$$
$$3\,c^2\,e^2\,(3\,b^2\,d^2-20\,a\,b\,d\,e-28\,a^2\,e^2))\,\sqrt{a+b\,x+c\,x^2}\Big)\Big/$$
$$\Big(3\,(b^2-4\,a\,c)^2\,(c\,d^2-b\,d\,e+a\,e^2)^3\,\sqrt{d+e\,x}\Big)-$$
$$\Bigg(\sqrt{2}\,(16\,c^4\,d^4-8\,b^4\,e^4-4\,c^3\,d^2\,e\,(8\,b\,d-15\,a\,e)+b^2\,c\,e^3\,(7\,b\,d+57\,a\,e)+$$
$$3\,c^2\,e^2\,(3\,b^2\,d^2-20\,a\,b\,d\,e-28\,a^2\,e^2))\,\sqrt{d+e\,x}\,\sqrt{-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}}$$
$$\text{EllipticE}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\Big],-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d-\big(b+\sqrt{b^2-4\,a\,c}\big)\,e}\Big]\Bigg)\Bigg/$$
$$\Bigg(3\,(b^2-4\,a\,c)^{3/2}\,(c\,d^2-b\,d\,e+a\,e^2)^3\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\big(b+\sqrt{b^2-4\,a\,c}\big)\,e}}\,\sqrt{a+b\,x+c\,x^2}\Bigg)+$$
$$\Bigg(8\,\sqrt{2}\,(2\,c\,d-b\,e)\,(2\,c^2\,d^2-b^2\,e^2-2\,c\,e\,(b\,d-3\,a\,e))\,\sqrt{\frac{c\,(d+e\,x)}{2\,c\,d-\big(b+\sqrt{b^2-4\,a\,c}\big)\,e}}$$

$$\sqrt{-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\ e}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\Bigg/$$

$$\left(3\left(b^2-4 a c\right)^{3/2}\left(c d^2-b d e+a e^2\right)^2\sqrt{d+e x}\ \sqrt{a+b x+c x^2}\right)$$

Result (type 4, 7870 leaves):

$$\frac{1}{\left(a+x\left(b+c x\right)\right)^{5/2}}$$

$$\sqrt{d+e x}\ \left(a+b x+c x^2\right)^3\left(-\frac{2 e^5}{\left(c d^2-b d e+a e^2\right)^3\left(d+e x\right)}-\left(2\left(-b c^2 d^2+2 b^2 c d e-\right.\right.\right.$$

$$\left.\left.4 a c^2 d e-b^3 e^2+3 a b c e^2-2 c^3 d^2 x+2 b c^2 d e x-b^2 c e^2 x+2 a c^2 e^2 x\right)\right)\Big/$$

$$\left(3\left(-b^2+4 a c\right)\left(c d^2-b d e+a e^2\right)^2\left(a+b x+c x^2\right)^2\right)-$$

$$\left(2\left(-8 b c^4 d^4+17 b^2 c^3 d^3 e-4 a c^4 d^3 e-6 b^3 c^2 d^2 e^2-24 a b c^3 d^2 e^2-8 b^4 c d e^3+69 a b^2 c^2 d e^3-\right.\right.$$

$$84 a^2 c^3 d e^3+5 b^5 e^4-37 a b^3 c e^4+60 a^2 b c^2 e^4-16 c^5 d^4 x+32 b c^4 d^3 e x-9 b^2 c^3 d^2 e^2 x-$$

$$\left.\left.60 a c^4 d^2 e^2 x-7 b^3 c^2 d e^3 x+60 a b c^3 d e^3 x+5 b^4 c e^4 x-33 a b^2 c^2 e^4 x+36 a^2 c^3 e^4 x\right)\right)\Big/$$

$$\left.\left(3\left(-b^2+4 a c\right)^2\left(c d^2-b d e+a e^2\right)^3\left(a+b x+c x^2\right)\right)\right)-$$

$$\frac{1}{3\left(-b^2+4 a c\right)^2 e\left(c d^2-b d e+a e^2\right)^3\left(a+x\left(b+c x\right)\right)^{5/2}}$$

$$2$$

$$c$$

$$\left(a+b x+c x^2\right)^{5/2}$$

$$\left(\left(\left(16 c^4 d^4-32 b c^3 d^3 e+9 b^2 c^2 d^2 e^2+60 a c^3 d^2 e^2+\right.\right.\right.$$

$$\left.7 b^3 c d e^3-60 a b c^2 d e^3-8 b^4 e^4+57 a b^2 c e^4-84 a^2 c^2 e^4\right)$$

$$\left.\left(d+e x\right)^{3/2}\left(c+\frac{c d^2}{\left(d+e x\right)^2}-\frac{b d e}{\left(d+e x\right)^2}+\frac{a e^2}{\left(d+e x\right)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}\right)\right)\Big/$$

$$\left(c\sqrt{\frac{\left(d+e x\right)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-\frac{1}{c\sqrt{\frac{(d+e x)^2\left(c\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{a e}{d+e x}\right)}{d+e x}\right)}{e^2}}}$$

$$\left(c d^2-b d e+a e^2\right)\left(d+e x\right)\sqrt{c+\frac{c d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{a e^2}{(d+e x)^2}-\frac{2 c d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(4 i \sqrt{2}\, c^4 d^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Bigg/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-\left(8 i \sqrt{2}\right.$$

$$b c^3 d^3 e\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(9\,\mathbb{i}\,b^2$$

$$c^2 d^2 e^2\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathbb{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\ \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(15\,\mathbb{i}\sqrt{2}\,a c^3 d^2 e^2$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(7\,\mathrm{i}\,b^3 c d e^3\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\right.\right.\right.$$

$$\left.\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\text{EllipticF}\left[\mathrm{i}\right.$$

$$\left.\left.\left.\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\right.$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(15\, i \sqrt{2}\, a b c^2 d e^3$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(2\, i$$

$$\sqrt{2}\, b^4 e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],$$

$$\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Big/\Bigg(\left(c d^2-b d e+a e^2\right)$$

$$\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\;\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)+\Bigg(57\,\mathrm{i}$$

$$a b^2 c e^4\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\Bigg(\text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[$$

$$\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]-\text{EllipticF}\Big[\mathrm{i}$$

$$\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\Big],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\Big]\Bigg)\Bigg)\Big/$$

$$\Bigg(2\sqrt{2}\left(c d^2-b d e+a e^2\right)\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}$$

$$\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\Bigg)-\Bigg(21\,\mathrm{i}\sqrt{2}\,a^2 c^2 e^4$$

$$\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right] -\right.$$

$$\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\right.$$

$$\left.\left.\left.\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/ \left(\left(c d^2-b d e+a e^2\right)\right.$$

$$\left.\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) +$$

$$\left(8 i \sqrt{2}\, c^4 d^3 \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right) -$$

$$\left(12 i \sqrt{2}\, b c^3 d^2 e \sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(24\,\mathbb{i}\sqrt{2}\,a c^3 d e^2\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)+$$

$$\left(2\,\mathbb{i}\sqrt{2}\,b^3 c e^3\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(c d^2-b d e+a e^2\right)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Bigg/$$

$$\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)-$$

$$\left(12 i \sqrt{2} a b c^2 e^3 \sqrt{1-\frac{2 (c d^2-b d e+a e^2)}{\left(2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\sqrt{1-\frac{2 (c d^2-b d e+a e^2)}{\left(2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 c d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Bigg/$$

$$\left(\left(\sqrt{-\frac{c d^2-b d e+a e^2}{2 c d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{c+\frac{c d^2-b d e+a e^2}{(d+e x)^2}+\frac{-2 c d+b e}{d+e x}}\right)\right)\right)$$

Problem 2482: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{3+5 x}}{\sqrt{2+5 x-12 x^2}} \, dx$$

Optimal (type 4, 30 leaves, 2 steps):

$$-\frac{1}{3} \sqrt{19} \text{EllipticE}\left[\text{ArcSin}\left[\frac{2 \sqrt{2-3 x}}{\sqrt{11}}\right], \frac{55}{76}\right]$$

Result (type 4, 86 leaves):

$$\frac{1}{3 \sqrt{2+5 x-12 x^2}} \sqrt{19} \sqrt{-1-4 x} \sqrt{2-3 x}$$

$$\left(-\text{EllipticE}\left[\text{ArcSin}\left[\frac{2 \sqrt{3+5 x}}{\sqrt{7}}\right], \frac{21}{76}\right]+\text{EllipticF}\left[\text{ArcSin}\left[\frac{2 \sqrt{3+5 x}}{\sqrt{7}}\right], \frac{21}{76}\right]\right)$$

Problem 2483: Result unnecessarily involves higher level functions.

$$\int (d+e x)^2 \left(a+b x+c x^2\right)^{4/3} dx$$

Optimal (type 4, 638 leaves, 6 steps):

$$-\frac{1}{935 c^4}3\left(b^2-4ac\right)\left(17c^2d^2+5b^2e^2-ce\left(17bd+3ae\right)\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{1/3}+\frac{3\left(17c^2d^2+5b^2e^2-ce\left(17bd+3ae\right)\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{4/3}}{374c^3}+\frac{15e\left(2cd-be\right)\left(a+bx+cx^2\right)^{7/3}}{119c^2}+\frac{3e\left(d+ex\right)\left(a+bx+cx^2\right)^{7/3}}{17c}+\left(2^{1/3}\times 3^{3/4}\sqrt{2+\sqrt{3}}\left(b^2-4ac\right)^2\left(17c^2d^2+5b^2e^2-ce\left(17bd+3ae\right)\right)\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)\sqrt{\left(\left(\left(b^2-4ac\right)^{2/3}-2^{2/3}c^{1/3}\left(b^2-4ac\right)^{1/3}\left(a+bx+cx^2\right)^{1/3}+2\times 2^{1/3}c^{2/3}\left(a+bx+cx^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/\left(935c^{13/3}\left(b+2cx\right)\sqrt{\frac{\left(b^2-4ac\right)^{1/3}\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 413 leaves):

$$-\frac{1}{26180c^5\left(a+x\left(b+cx\right)\right)^{2/3}}3\left(2c\left(a+x\left(b+cx\right)\right)\left(70b^5e^2-7b^4ce\left(34d+5ex\right)+b^2c^2\left(ae\left(1547d+211ex\right)-cx\left(119d^2+85dex+20e^2x^2\right)\right)+b^3c\left(-497ae^2+c\left(238d^2+119dex+25e^2x^2\right)\right)-bc^2\left(-823a^2e^2+15c^2x^2\left(119d^2+170dex+66e^2x^2\right)+ac\left(1547d^2+646dex+125e^2x^2\right)\right)-2c^3\left(a^2e\left(935d+112ex\right)+5c^2x^3\left(119d^2+187dex+77e^2x^2\right)+acx\left(1547d^2+1870dex+665e^2x^2\right)\right)\right)-7\times 2^{1/3}\left(b^2-4ac\right)^2\left(17c^2d^2+5b^2e^2-ce\left(17bd+3ae\right)\right)\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)$$

Problem 2484: Result unnecessarily involves higher level functions.

$$\int\left(d+ex\right)\left(a+bx+cx^2\right)^{4/3}dx$$

Optimal (type 4, 539 leaves, 5 steps):

$$-\frac{3\left(b^2-4ac\right)\left(2cd-be\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{1/3}}{110c^3}+\frac{3\left(2cd-be\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{4/3}}{44c^2}+\frac{3e\left(a+bx+cx^2\right)^{7/3}}{14c}+$$

$$\left(3^{3/4}\sqrt{2+\sqrt{3}}\left(b^2-4ac\right)^2\left(2cd-be\right)\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(\left(b^2-4ac\right)^{2/3}-2^{2/3}c^{1/3}\left(b^2-4ac\right)^{1/3}\left(a+bx+cx^2\right)^{1/3}+2\times2^{1/3}c^{2/3}\left(a+bx+cx^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2\right)}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(55\times2^{2/3}c^{10/3}\left(b+2cx\right)\sqrt{\frac{\left(b^2-4ac\right)^{1/3}\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 273 leaves):

$$-\frac{1}{3080c^4\left(a+x\left(b+cx\right)\right)^{2/3}}$$
$$3\left(2c\left(a+x\left(b+cx\right)\right)\left(-14b^4e+7b^3c\left(4d+ex\right)+b^2c\left(91ae-cx\left(14d+5ex\right)\right)-\right.\right.$$
$$2bc^2\left(15cx^2\left(7d+5ex\right)+a\left(91d+19ex\right)\right)-$$
$$\left.2c^2\left(55a^2e+5c^2x^3\left(14d+11ex\right)+2acx\left(91d+55ex\right)\right)\right)+$$
$$7\times2^{1/3}\left(b^2-4ac\right)^2\left(-2cd+be\right)\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{2/3}$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)$$

Problem 2485: Result unnecessarily involves higher level functions.

$$\int\left(a+bx+cx^2\right)^{4/3}dx$$

Optimal (type 4, 490 leaves, 4 steps):

$$-\frac{3\left(b^2-4ac\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{1/3}}{55c^2}+\frac{3\left(b+2cx\right)\left(a+bx+cx^2\right)^{4/3}}{22c}+$$
$$\left(2^{1/3}\times 3^{3/4}\sqrt{2+\sqrt{3}}\left(b^2-4ac\right)^2\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(\left(b^2-4ac\right)^{2/3}-2^{2/3}c^{1/3}\left(b^2-4ac\right)^{1/3}\left(a+bx+cx^2\right)^{1/3}+2\times 2^{1/3}c^{2/3}\left(a+bx+cx^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2\right)}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(55c^{7/3}\left(b+2cx\right)\sqrt{\frac{\left(b^2-4ac\right)^{1/3}\left(\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\left(b^2-4ac\right)^{1/3}+2^{2/3}c^{1/3}\left(a+bx+cx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 179 leaves):

$$\left(3\left(2c\left(b+2cx\right)\left(a+x\left(b+cx\right)\right)\left(-2b^2+5bcx+c\left(13a+5cx^2\right)\right)+\right.\right.$$
$$2^{1/3}\left(b^2-4ac\right)^2\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{2/3}$$
$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)\right)\Big/\left(220c^3\left(a+x\left(b+cx\right)\right)^{2/3}\right)$$

Problem 2486: Unable to integrate problem.

$$\int\frac{\left(a+bx+cx^2\right)^{4/3}}{d+ex}\,dx$$

Optimal (type 6, 180 leaves, 2 steps):

$$\left(3\left(a+bx+cx^2\right)^{4/3}\text{AppellF1}\left[-\frac{8}{3},-\frac{4}{3},-\frac{4}{3},-\frac{5}{3},\frac{2cd-\left(b-\sqrt{b^2-4ac}\right)e}{2c\left(d+ex\right)},\frac{2d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{c}}{2\left(d+ex\right)}\right]\right)\Big/$$
$$\left(2^{1/3}e\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\left(d+ex\right)}\right)^{4/3}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\left(d+ex\right)}\right)^{4/3}\right)$$

Result (type 8, 24 leaves):

$$\int\frac{\left(a+bx+cx^2\right)^{4/3}}{d+ex}\,dx$$

Problem 2487: Unable to integrate problem.

$$\int \frac{\left(a+b x+c x^2\right)^{4/3}}{(d+e x)^2} \, dx$$

Optimal (type 6, 189 leaves, 2 steps):

$$\left(12 \times 2^{2/3} \left(a+b x+c x^2\right)^{4/3} \text{AppellF1}\left[-\frac{5}{3},-\frac{4}{3},-\frac{4}{3},-\frac{2}{3},\frac{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e}{2 c (d+e x)},\frac{2 d-\frac{\left(b+\sqrt{b^2-4 a c}\right) e}{c}}{2 (d+e x)}\right]\right) \Big/ \left(5 e \left(\frac{e \left(b-\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{4/3} \left(\frac{e \left(b+\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{4/3} (d+e x)\right)$$

Result (type 8, 24 leaves):

$$\int \frac{\left(a+b x+c x^2\right)^{4/3}}{(d+e x)^2} \, dx$$

Problem 2488: Unable to integrate problem.

$$\int \frac{\left(a+b x+c x^2\right)^{4/3}}{(d+e x)^3} \, dx$$

Optimal (type 6, 187 leaves, 2 steps):

$$\left(6 \times 2^{2/3} \left(a+b x+c x^2\right)^{4/3} \text{AppellF1}\left[-\frac{2}{3},-\frac{4}{3},-\frac{4}{3},\frac{1}{3},\frac{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e}{2 c (d+e x)},\frac{2 d-\frac{\left(b+\sqrt{b^2-4 a c}\right) e}{c}}{2 (d+e x)}\right]\right) \Big/ \left(e \left(\frac{e \left(b-\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{4/3} \left(\frac{e \left(b+\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{4/3} (d+e x)^2\right)$$

Result (type 8, 24 leaves):

$$\int \frac{\left(a+b\,x+c\,x^2\right)^{4/3}}{\left(d+e\,x\right)^3}\,dx$$

Problem 2489: Result unnecessarily involves higher level functions.

$$\int \frac{\left(d+e\,x\right)^3}{\left(a+b\,x+c\,x^2\right)^{7/3}}\,dx$$

Optimal (type 4, 1224 leaves, 6 steps):

$$-\frac{3\,(d+e\,x)^2\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{4\,(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^{4/3}}+$$

$$\left(3\,\left(10\,b\,c\,d\,(c\,d^2+3\,a\,e^2)-8\,a\,c\,e\,(2\,c\,d^2+3\,a\,e^2)-b^2\,(11\,c\,d^2\,e-a\,e^3)+(2\,c\,d-b\,e)\,\left(10\,c^2\,d^2-b^2\,e^2-2\,c\,e\,(5\,b\,d-7\,a\,e)\right)\,x\right)\right)\Big/\left(4\,c\,(b^2-4\,a\,c)^2\,(a+b\,x+c\,x^2)^{1/3}\right)-$$

$$\left(3\,(2\,c\,d-b\,e)\,\left(5\,c^2\,d^2-b^2\,e^2-c\,e\,(5\,b\,d-9\,a\,e)\right)\,(b+2\,c\,x)\right)\Big/\left(2\times 2^{1/3}\,c^{5/3}\,(b^2-4\,a\,c)^2\,\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)\right)+$$

$$\left(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,(2\,c\,d-b\,e)\,\left(5\,c^2\,d^2-b^2\,e^2-c\,e\,(5\,b\,d-9\,a\,e)\right)\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)\sqrt{\left(\left((b^2-4\,a\,c)^{2/3}-2^{2/3}\,c^{1/3}\,(b^2-4\,a\,c)^{1/3}\,(a+b\,x+c\,x^2)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,(a+b\,x+c\,x^2)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2\right)}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}{\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}\right],-7-4\,\sqrt{3}\right]\right)\Big/$$

$$\left(4\times 2^{1/3}\,c^{5/3}\,(b^2-4\,a\,c)^{5/3}\,(b+2\,c\,x)\sqrt{\frac{(b^2-4\,a\,c)^{1/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2}}\right)-$$

$$\left(3^{3/4}\,(2\,c\,d-b\,e)\,\left(5\,c^2\,d^2-b^2\,e^2-c\,e\,(5\,b\,d-9\,a\,e)\right)\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)\sqrt{\left(\left((b^2-4\,a\,c)^{2/3}-2^{2/3}\,c^{1/3}\,(b^2-4\,a\,c)^{1/3}\,(a+b\,x+c\,x^2)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,(a+b\,x+c\,x^2)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2\right)}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}{\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}\right],-7-4\,\sqrt{3}\right]\right)\Big/$$

$$\left(2^{5/6}\,c^{5/3}\,(b^2-4\,a\,c)^{5/3}\,(b+2\,c\,x)\sqrt{\frac{(b^2-4\,a\,c)^{1/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2}}\right)$$

Result (type 5, 400 leaves):

$$-\frac{1}{16\,c^2\,\left(b^2-4\,a\,c\right)^2\,\left(a+x\,\left(b+c\,x\right)\right)^{4/3}}\,3\,\Bigg(4\,\left(b^2-4\,a\,c\right)\,\left(-b^3\,e^3\,x+b^2\,e^2\,\left(-a\,e+3\,c\,d\,x\right)+2\,c\,\left(a^2\,e^3+c^2\,d^3\,x-3\,a\,c\,d\,e\,\left(d+e\,x\right)\right)+b\,c\,\left(c\,d^2\,\left(d-3\,e\,x\right)+3\,a\,e^2\,\left(d+e\,x\right)\right)\right)-4\,\left(a+x\,\left(b+c\,x\right)\right)\,\left(-b^4\,e^3+b^3\,c\,e^2\,\left(3\,d+2\,e\,x\right)+4\,c^2\,\left(-8\,a^2\,e^3+5\,c^2\,d^3\,x+9\,a\,c\,d\,e^2\,x\right)+2\,b\,c^2\,\left(5\,c\,d^2\,\left(d-3\,e\,x\right)+9\,a\,e^2\,\left(d-e\,x\right)\right)+b^2\,c\,e\,\left(7\,a\,e^2+3\,c\,d\,\left(-5\,d+2\,e\,x\right)\right)\right)+2^{2/3}\,\left(-2\,c\,d+b\,e\right)\,\left(-5\,c^2\,d^2+b^2\,e^2+c\,e\,\left(5\,b\,d-9\,a\,e\right)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/3}\,\left(a+x\,\left(b+c\,x\right)\right)\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\Bigg)$$

Problem 2490: Result unnecessarily involves higher level functions.

$$\int\frac{\left(d+e\,x\right)^2}{\left(a+b\,x+c\,x^2\right)^{7/3}}\,dx$$

Optimal (type 4, 1153 leaves, 6 steps):

$$-\frac{3\,(d+e\,x)\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{4\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^{4/3}}-\left(3\,\left(4\,b^2\,d\,e+4\,a\,c\,d\,e-5\,b\,\left(c\,d^2+a\,e^2\right)-\left(10\,c^2\,d^2+b^2\,e^2-2\,c\,e\,(5\,b\,d-3\,a\,e)\right)\,x\right)\right)\Big/$$
$$\left(2\,\left(b^2-4\,a\,c\right)^2\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)-\left(3\,\left(10\,c^2\,d^2+b^2\,e^2-2\,c\,e\,(5\,b\,d-3\,a\,e)\right)\,(b+2\,c\,x)\right)\Big/$$
$$\left(2\times 2^{1/3}\,c^{2/3}\,\left(b^2-4\,a\,c\right)^2\,\left(\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)\right)+$$
$$\left(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,\left(10\,c^2\,d^2+b^2\,e^2-2\,c\,e\,(5\,b\,d-3\,a\,e)\right)\,\left(\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(\left(b^2-4\,a\,c\right)^{2/3}-2^{2/3}\,c^{1/3}\,\left(b^2-4\,a\,c\right)^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,\left(a+b\,x+c\,x^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)^2\right)}\;\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}}\Big],\,-7-4\,\sqrt{3}\,\Big]\right)\Big/\left(4\times 2^{1/3}\right.$$
$$\left.c^{2/3}\,\left(b^2-4\,a\,c\right)^{5/3}\,(b+2\,c\,x)\,\sqrt{\frac{\left(b^2-4\,a\,c\right)^{1/3}\,\left(\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)^2}}\right)-$$
$$\left(3^{3/4}\,\left(10\,c^2\,d^2+b^2\,e^2-2\,c\,e\,(5\,b\,d-3\,a\,e)\right)\,\left(\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(\left(b^2-4\,a\,c\right)^{2/3}-2^{2/3}\,c^{1/3}\,\left(b^2-4\,a\,c\right)^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,\left(a+b\,x+c\,x^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)^2\right)}$$
$$\left.\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}}\Big],\,-7-4\,\sqrt{3}\,\Big]\right)\Big/$$
$$\left(2^{5/6}\,c^{2/3}\,\left(b^2-4\,a\,c\right)^{5/3}\,(b+2\,c\,x)\,\sqrt{\frac{\left(b^2-4\,a\,c\right)^{1/3}\,\left(\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,\left(b^2-4\,a\,c\right)^{1/3}+2^{2/3}\,c^{1/3}\,\left(a+b\,x+c\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 278 leaves) :

$$-\frac{1}{16\,c\,\left(b^2-4\,a\,c\right)^2\,\left(a+x\,\left(b+c\,x\right)\right)^{4/3}}$$
$$3\,\left(-4\,\left(10\,c^2\,d^2+b^2\,e^2+2\,c\,e\,\left(-5\,b\,d+3\,a\,e\right)\right)\,\left(b+2\,c\,x\right)\,\left(a+x\,\left(b+c\,x\right)\right)+\right.$$
$$4\,\left(b^2-4\,a\,c\right)\,\left(a\,b\,e^2+2\,c^2\,d^2\,x+b^2\,e^2\,x+b\,c\,d\,\left(d-2\,e\,x\right)-2\,a\,c\,e\,\left(2\,d+e\,x\right)\right)+$$
$$2^{2/3}\,\left(10\,c^2\,d^2+b^2\,e^2+2\,c\,e\,\left(-5\,b\,d+3\,a\,e\right)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/3}$$
$$\left.\left(a+x\,\left(b+c\,x\right)\right)\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)$$

Problem 2491: Result unnecessarily involves higher level functions.

$$\int\frac{d+e\,x}{\left(a+b\,x+c\,x^2\right)^{7/3}}\,dx$$

Optimal (type 4, 1043 leaves, 6 steps):

$$-\frac{3\left(b d-2 a e+(2 c d-b e) x\right)}{4\left(b^2-4 a c\right)\left(a+b x+c x^2\right)^{4/3}}+\frac{15(2 c d-b e)(b+2 c x)}{4\left(b^2-4 a c\right)^2\left(a+b x+c x^2\right)^{1/3}}-\left(15 c^{1/3}(2 c d-b e)(b+2 c x)\right)\Big/\left(2\times 2^{1/3}\left(b^2-4 a c\right)^2\left(\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)\right)+$$

$$\left(15\times 3^{1/4}\sqrt{2-\sqrt{3}}\, c^{1/3}(2 c d-b e)\left(\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)\sqrt{\left(\left(\left(b^2-4 a c\right)^{2/3}-2^{2/3} c^{1/3}\left(b^2-4 a c\right)^{1/3}\left(a+b x+c x^2\right)^{1/3}+2\times 2^{1/3} c^{2/3}\left(a+b x+c x^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)^2\right)}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(4\times 2^{1/3}\left(b^2-4 a c\right)^{5/3}(b+2 c x)\sqrt{\frac{\left(b^2-4 a c\right)^{1/3}\left(\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(5\times 3^{3/4} c^{1/3}(2 c d-b e)\left(\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)\sqrt{\left(\left(\left(b^2-4 a c\right)^{2/3}-2^{2/3} c^{1/3}\left(b^2-4 a c\right)^{1/3}\left(a+b x+c x^2\right)^{1/3}+2\times 2^{1/3} c^{2/3}\left(a+b x+c x^2\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)^2\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}}{\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(2^{5/6}\left(b^2-4 a c\right)^{5/3}(b+2 c x)\sqrt{\frac{\left(b^2-4 a c\right)^{1/3}\left(\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\left(b^2-4 a c\right)^{1/3}+2^{2/3} c^{1/3}\left(a+b x+c x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 200 leaves):

$$\left(3\left(20(2 c d-b e)(b+2 c x)+\frac{4\left(b^2-4 a c\right)(-b d+2 a e-2 c d x+b e x)}{a+x(b+c x)}+5\times 2^{2/3}(-2 c d+b e)\left(b-\sqrt{b^2-4 a c}+2 c x\right)\left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-b+\sqrt{b^2-4 a c}-2 c x}{2\sqrt{b^2-4 a c}}\right]\right)\right)\Big/\left(16\left(b^2-4 a c\right)^2(a+x(b+c x))^{1/3}\right)$$

Problem 2492: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+b x+c x^2\right)^{7/3}}\,dx$$

Optimal (type 4, 993 leaves, 6 steps):

$$-\frac{3\,(b+2\,c\,x)}{4\,(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^{4/3}}+\frac{15\,c\,(b+2\,c\,x)}{2\,(b^2-4\,a\,c)^2\,(a+b\,x+c\,x^2)^{1/3}}-$$
$$\left(15\,c^{4/3}\,(b+2\,c\,x)\right)\Big/\left(2^{1/3}\,(b^2-4\,a\,c)^2\,\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)\right)+$$
$$\Bigg(15\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\;c^{4/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)$$
$$\sqrt{\left(\left((b^2-4\,a\,c)^{2/3}-2^{2/3}\,c^{1/3}\,(b^2-4\,a\,c)^{1/3}\,(a+b\,x+c\,x^2)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,(a+b\,x+c\,x^2)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2\right)}$$
$$\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}{\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}\right],\,-7-4\,\sqrt{3}\right]\Bigg)\Bigg/$$
$$\left(2\times 2^{1/3}\,(b^2-4\,a\,c)^{5/3}\,(b+2\,c\,x)\,\sqrt{\frac{(b^2-4\,a\,c)^{1/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2}}\right)-$$
$$\Bigg(5\times 2^{1/6}\times 3^{3/4}\,c^{4/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)$$
$$\sqrt{\left(\left((b^2-4\,a\,c)^{2/3}-2^{2/3}\,c^{1/3}\,(b^2-4\,a\,c)^{1/3}\,(a+b\,x+c\,x^2)^{1/3}+2\times 2^{1/3}\,c^{2/3}\,(a+b\,x+c\,x^2)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2\right)}$$
$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}{\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}}\right],\,-7-4\,\sqrt{3}\right]\Bigg)\Bigg/$$
$$\left((b^2-4\,a\,c)^{5/3}\,(b+2\,c\,x)\,\sqrt{\frac{(b^2-4\,a\,c)^{1/3}\,\left((b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)}{\left(\left(1+\sqrt{3}\right)\,(b^2-4\,a\,c)^{1/3}+2^{2/3}\,c^{1/3}\,(a+b\,x+c\,x^2)^{1/3}\right)^2}}\right)$$

Result (type 5, 173 leaves):

$$\Bigg(3\,\Bigg(20\,c\,(b+2\,c\,x)-\frac{2\,(b^2-4\,a\,c)\,(b+2\,c\,x)}{a+x\,(b+c\,x)}-5\times 2^{2/3}\,c\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)$$
$$\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg/$$
$$\left(8\,(b^2-4\,a\,c)^2\,(a+x\,(b+c\,x))^{1/3}\right)$$

Problem 2496: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(d+e\,x)\,(c^2\,d^2-b\,c\,d\,e+b^2\,e^2+3\,b\,c\,e^2\,x+3\,c^2\,e^2\,x^2)^{1/3}}\,dx$$

Optimal (type 3, 242 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 (c d-b e-c e x)}{\sqrt{3} (2 c d-b e)^{1/3} \left(c^2 d^2-b c d e+b^2 e^2+3 b c e^2 x+3 c^2 e^2 x^2\right)^{1/3}}\right]}{\sqrt{3} e (2 c d-b e)^{2/3}}-\frac{\text{Log}[d+e x]}{2 e (2 c d-b e)^{2/3}}+\text{Log}\left[3 c e^2 (c d-b e)-3 c^2 e^3 x-3 c e^2 (2 c d-b e)^{1/3} \left(c^2 d^2-b c d e+b^2 e^2+3 b c e^2 x+3 c^2 e^2 x^2\right)^{1/3}\right]\Big/\left(2 e (2 c d-b e)^{2/3}\right)$$

Result (type 6, 317 leaves):

$$-\left(\left(3^{1/3} \left(\frac{3 b c e^2-\sqrt{3} \sqrt{-c^2 e^2 (-2 c d+b e)^2}+6 c^2 e^2 x}{c^2 e (d+e x)}\right)^{1/3} \left(\frac{3 b c e^2+\sqrt{3} \sqrt{-c^2 e^2 (-2 c d+b e)^2}+6 c^2 e^2 x}{c^2 e (d+e x)}\right)^{1/3} \text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{-6 c^2 d e+3 b c e^2+\sqrt{3} \sqrt{-c^2 e^2 (-2 c d+b e)^2}}{6 c^2 e (d+e x)},\frac{6 c^2 d e-3 b c e^2+\sqrt{3} \sqrt{-c^2 e^2 (-2 c d+b e)^2}}{6 c^2 e (d+e x)}\right]\right)\Big/\left(2\times 2^{2/3} e \left(b^2 e^2+b c e (-d+3 e x)+c^2 \left(d^2+3 e^2 x^2\right)\right)^{1/3}\right)\right)$$

Problem 2497: Result unnecessarily involves higher level functions.

$$\int \frac{(2+3 x)^3}{\left(52-54 x+27 x^2\right)^{1/3}} \, dx$$

Optimal (type 4, 635 leaves, 7 steps):

$$\frac{1}{30}(2+3x)^2\left(52-54x+27x^2\right)^{2/3}+\frac{1}{7}(27+8x)\left(52-54x+27x^2\right)^{2/3}+$$

$$\frac{9000\times 5^{1/3}(1-x)}{7\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)}-$$

$$\left(25\times 5^{5/6}\sqrt{2+\sqrt{3}}\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\right.$$

$$\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\right.}$$

$$\overline{\left.\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(189\sqrt{2}\,3^{1/4}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(50\times 5^{5/6}\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\right.$$

$$\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\right.}$$

$$\overline{\left.\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(189\times 3^{3/4}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 124 leaves):

$$\left(43576-28404x+8406x^2+5346x^3+1701x^4+\right.$$

$$250\times 3^{1/3}\times 10^{2/3}\left(9i+5\sqrt{3}-9ix\right)^{1/3}\left(-5i-3\sqrt{3}+3\sqrt{3}x\right)$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-9i+5\sqrt{3}+9ix}{10\sqrt{3}}\right]\right)\Big/\left(210\left(52-54x+27x^2\right)^{1/3}\right)$$

Problem 2498: Result unnecessarily involves higher level functions.

$$\int\frac{(2+3x)^2}{\left(52-54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 628 leaves, 8 steps):

$$\frac{25}{42}\left(52-54x+27x^2\right)^{2/3}+\frac{1}{21}(2+3x)\left(52-54x+27x^2\right)^{2/3}+\frac{2700\times 5^{1/3}(1-x)}{7\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)}-$$

$$\left(5\times 5^{5/6}\sqrt{2+\sqrt{3}}\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(126\sqrt{2}\,3^{1/4}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(5\times 5^{5/6}\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(63\times 3^{3/4}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 119 leaves):

$$\left(1508-1254x+459x^2+162x^3+15\times 3^{1/3}\times 10^{2/3}\left(9i+5\sqrt{3}-9ix\right)^{1/3}\left(-5i-3\sqrt{3}+3\sqrt{3}\,x\right)\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-9i+5\sqrt{3}+9ix}{10\sqrt{3}}\right]\right)\Big/\left(42\left(52-54x+27x^2\right)^{1/3}\right)$$

Problem 2499: Result unnecessarily involves higher level functions.

$$\int\frac{2+3x}{\left(52-54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 603 leaves, 6 steps):

$$\frac{1}{12}\left(52-54x+27x^2\right)^{2/3}+\frac{90\times 5^{1/3}\,(1-x)}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}-$$

$$\left(5^{5/6}\sqrt{2+\sqrt{3}}\,\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(108\sqrt{2}\,3^{1/4}\,(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(5^{5/6}\left(30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)\right.$$
$$\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2\right)}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(54\times 3^{3/4}\,(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 113 leaves):

$$\left(52-54x+27x^2+3^{1/3}\times 10^{2/3}\left(9i+5\sqrt{3}-9ix\right)^{1/3}\left(-5i-3\sqrt{3}+3\sqrt{3}\,x\right)\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-9i+5\sqrt{3}+9ix}{10\sqrt{3}}\right]\right)\Big/\left(12\left(52-54x+27x^2\right)^{1/3}\right)$$

Problem 2500: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{(2+3x)\left(52-54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 108 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}\,(8-3\,x)}{\sqrt{3}\,5^{1/3}\,\left(52-54\,x+27\,x^2\right)^{1/3}}\right]}{3\,\sqrt{3}\,10^{2/3}}-\frac{\text{Log}[2+3\,x]}{6\times10^{2/3}}+\frac{\text{Log}\left[216-81\,x-27\times10^{1/3}\,\left(52-54\,x+27\,x^2\right)^{1/3}\right]}{6\times10^{2/3}}$$

Result (type 6, 288 leaves):

$$-\left(\left(\left(2+3\,x\right)\,\left(-9-5\,i\,\sqrt{3}+9\,x\right)\,\left(-9+5\,i\,\sqrt{3}+9\,x\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,i\,\sqrt{3}}{6+9\,x},\frac{15+5\,i\,\sqrt{3}}{6+9\,x}\right]\right)\Big/\left(2\,\left(52-54\,x+27\,x^2\right)^{4/3}\,\left(\left(6+9\,x\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,i\,\sqrt{3}}{6+9\,x},\frac{15+5\,i\,\sqrt{3}}{6+9\,x}\right]+\left(3+i\,\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{15-5\,i\,\sqrt{3}}{6+9\,x},\frac{15+5\,i\,\sqrt{3}}{6+9\,x}\right]+\left(3-i\,\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{15-5\,i\,\sqrt{3}}{6+9\,x},\frac{15+5\,i\,\sqrt{3}}{6+9\,x}\right]\right)\right)\right)$$

Problem 2501: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(2+3\,x\right)^2\,\left(52-54\,x+27\,x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 719 leaves, 8 steps):

$$-\frac{\left(52-54 x+27 x^2\right)^{2/3}}{300 (2+3 x)}+\frac{9 (1-x)}{10\times 5^{2/3}\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)}-$$

$$\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}(8-3 x)}{\sqrt{3}\, 5^{1/3}\left(52-54 x+27 x^2\right)^{1/3}}\right]}{30\sqrt{3}\, 10^{2/3}}-$$

$$\left(\sqrt{2+\sqrt{3}}\left(30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}+\right.\right.}\right.$$

$$\left.\left.10^{2/3}\left(2700+(-54+54 x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2\right)$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(10800\sqrt{2}\, 3^{1/4}\times 5^{1/6}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)\right.$$

$$\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54 x)^2\right)^{2/3}\right)\Big/\right.}$$

$$\left.\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2\right)$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(5400\times 3^{3/4}\times 5^{1/6}(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2}}\right)-$$

$$\frac{\text{Log}[2+3 x]}{60\times 10^{2/3}}+\frac{\text{Log}\left[216-81 x-27\times 10^{1/3}\left(52-54 x+27 x^2\right)^{1/3}\right]}{60\times 10^{2/3}}$$

Result (type 6, 402 leaves) :

$$\left(-\frac{60\left(52-54x+27x^2\right)^2}{2+3x}-\left(900\,(2+3x)\left(-9-5\,\mathrm{i}\sqrt{3}+9x\right)\left(-9+5\,\mathrm{i}\sqrt{3}+9x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,\mathrm{i}\sqrt{3}}{6+9x},\frac{15+5\,\mathrm{i}\sqrt{3}}{6+9x}\right]\right)\Big/\left((6+9x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,\mathrm{i}\sqrt{3}}{6+9x},\frac{15+5\,\mathrm{i}\sqrt{3}}{6+9x}\right]+\left(3+\mathrm{i}\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{15-5\,\mathrm{i}\sqrt{3}}{6+9x},\frac{15+5\,\mathrm{i}\sqrt{3}}{6+9x}\right]+\left(3-\mathrm{i}\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{15-5\,\mathrm{i}\sqrt{3}}{6+9x},\frac{15+5\,\mathrm{i}\sqrt{3}}{6+9x}\right]\right)+3^{5/6}\times 10^{2/3}\left(9\,\mathrm{i}+5\sqrt{3}-9\,\mathrm{i}\,x\right)^{1/3}\left(-9-5\,\mathrm{i}\sqrt{3}+9x\right)\left(52-54x+27x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-9\,\mathrm{i}+5\sqrt{3}+9\,\mathrm{i}\,x}{10\sqrt{3}}\right]\right)\Big/\left(18000\left(52-54x+27x^2\right)^{4/3}\right)$$

Problem 2502: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(2+3x)^3\left(52-54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 744 leaves, 9 steps):

$$-\frac{\left(52-54 x+27 x^2\right)^{2/3}}{600\,(2+3 x)^2}-\frac{\left(52-54 x+27 x^2\right)^{2/3}}{1500\,(2+3 x)}+\frac{9\,(1-x)}{50\times 5^{2/3}\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}\,(8-3 x)}{\sqrt{3}\,5^{1/3}\left(52-54 x+27 x^2\right)^{1/3}}\right]}{300\sqrt{3}\,10^{2/3}}-$$

$$\left(\sqrt{2+\sqrt{3}}\left(30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54 x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2\right)}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(54000\sqrt{2}\,3^{1/4}\times 5^{1/6}\,(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)\sqrt{\left(\left(900+30\times 10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}+10^{2/3}\left(2700+(-54+54 x)^2\right)^{2/3}\right)\Big/\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{30\left(1+\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(27000\times 3^{3/4}\times 5^{1/6}\,(1-x)\sqrt{-\frac{30-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}}{\left(30\left(1-\sqrt{3}\right)-10^{1/3}\left(2700+(-54+54 x)^2\right)^{1/3}\right)^2}}\right)-$$

$$\frac{\text{Log}[2+3 x]}{600\times 10^{2/3}}+\frac{\text{Log}\left[216-81 x-27\times 10^{1/3}\left(52-54 x+27 x^2\right)^{1/3}\right]}{600\times 10^{2/3}}$$

Result (type 6, 407 leaves) :

$$\left(-\frac{90\,(3+2x)\,\left(52-54x+27x^2\right)^2}{(2+3x)^2}-\left(450\,(2+3x)\,\left(-9-5\,i\sqrt{3}+9x\right)\right.\right.$$
$$\left.\left(-9+5\,i\sqrt{3}+9x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,i\sqrt{3}}{6+9x},\frac{15+5\,i\sqrt{3}}{6+9x}\right]\right)\Big/$$
$$\left((6+9x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{15-5\,i\sqrt{3}}{6+9x},\frac{15+5\,i\sqrt{3}}{6+9x}\right]+\right.$$
$$\left(3+i\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{15-5\,i\sqrt{3}}{6+9x},\frac{15+5\,i\sqrt{3}}{6+9x}\right]+$$
$$\left.\left(3-i\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{15-5\,i\sqrt{3}}{6+9x},\frac{15+5\,i\sqrt{3}}{6+9x}\right]\right)+$$
$$3^{5/6}\times10^{2/3}\left(9\,i+5\sqrt{3}-9\,i\,x\right)^{1/3}\left(-9-5\,i\sqrt{3}+9x\right)\left(52-54x+27x^2\right)$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{-9\,i+5\sqrt{3}+9\,i\,x}{10\sqrt{3}}\right]\right)\Big/\left(90\,000\left(52-54x+27x^2\right)^{4/3}\right)$$

Problem 2503: Result unnecessarily involves higher level functions.

$$\int\frac{(2+3x)^3}{\left(28+54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 589 leaves, 7 steps):

$$\frac{1}{30}(2+3x)^2\left(28+54x+27x^2\right)^{2/3}-\frac{1}{35}(1+8x)\left(28+54x+27x^2\right)^{2/3}+\frac{72(1+x)}{7\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)}-$$

$$\left(\sqrt{2\left(2+\sqrt{3}\right)}\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

$$\left(63\times3^{1/4}(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(4\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\bigg/$$

$$\left(63\times3^{3/4}(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 120 leaves) :

$$\left(616+2196x+4302x^2+4374x^3+1701x^4-10\times2^{2/3}\times3^{1/3}\left(-9\,i+\sqrt{3}-9\,i\,x\right)^{1/3}\left(-i+3\sqrt{3}+3\sqrt{3}\,x\right)\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{9\,i+\sqrt{3}+9\,i\,x}{2\sqrt{3}}\right]\right)\bigg/\left(210\left(28+54x+27x^2\right)^{1/3}\right)$$

Problem 2504: Result unnecessarily involves higher level functions.

$$\int\frac{(2+3x)^2}{\left(28+54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 585 leaves, 7 steps) :

$$-\frac{5}{42}\left(28+54x+27x^2\right)^{2/3}+\frac{1}{21}(2+3x)\left(28+54x+27x^2\right)^{2/3}-\frac{108(1+x)}{7\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)}+$$

$$\left(\sqrt{2+\sqrt{3}}\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(21\sqrt{2}\,3^{1/4}(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(2\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(21\times 3^{3/4}(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 115 leaves):

$$\left(-28+114x+297x^2+162x^3+3\times 2^{2/3}\times 3^{1/3}\left(-9\,i+\sqrt{3}-9\,i\,x\right)^{1/3}\left(-i+3\sqrt{3}+3\sqrt{3}\,x\right)\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{9\,i+\sqrt{3}+9\,i\,x}{2\sqrt{3}}\right]\right)\Bigg/\left(42\left(28+54x+27x^2\right)^{1/3}\right)$$

Problem 2505: Result unnecessarily involves higher level functions.

$$\int\frac{2+3x}{\left(28+54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 560 leaves, 6 steps):

$$\frac{1}{12}\left(28+54x+27x^2\right)^{2/3}+\frac{18\,(1+x)}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}-$$

$$\left(\sqrt{2+\sqrt{3}}\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(18\sqrt{2}\;3^{1/4}\,(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(9\times 3^{3/4}\,(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 109 leaves):

$$\left(28+54x+27x^2+2^{2/3}\times 3^{1/3}\left(-9i+\sqrt{3}-9ix\right)^{1/3}\left(i-3\sqrt{3}-3\sqrt{3}\,x\right)\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{9i+\sqrt{3}+9ix}{2\sqrt{3}}\right]\right)\Big/\left(12\left(28+54x+27x^2\right)^{1/3}\right)$$

Problem 2506: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{(2+3x)\left(28+54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 103 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}(4+3x)}{\sqrt{3}\left(28+54x+27x^2\right)^{1/3}}\right]}{3\times 2^{2/3}\sqrt{3}}-\frac{\text{Log}[2+3x]}{6\times 2^{2/3}}+\frac{\text{Log}\left[-108-81x+27\times 2^{1/3}\left(28+54x+27x^2\right)^{1/3}\right]}{6\times 2^{2/3}}$$

Result (type 6, 294 leaves):

$$-\left(\left(5\,(2+3x)\left(9-i\sqrt{3}+9x\right)\left(9+i\sqrt{3}+9x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+i\sqrt{3}}{6+9x},\frac{-3+i\sqrt{3}}{6+9x}\right]\right)\Big/\left(2\left(28+54x+27x^2\right)^{4/3}\left(15\,(2+3x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+i\sqrt{3}}{6+9x},\frac{-3+i\sqrt{3}}{6+9x}\right]+i\left(3i+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},-\frac{3+i\sqrt{3}}{6+9x},\frac{-3+i\sqrt{3}}{6+9x}\right]+\left(-3-i\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},-\frac{3+i\sqrt{3}}{6+9x},\frac{-3+i\sqrt{3}}{6+9x}\right]\right)\right)\right)$$

Problem 2507: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(2+3x)^2\left(28+54x+27x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 671 leaves, 9 steps):

$$-\frac{\left(28+54x+27x^2\right)^{2/3}}{12\,(2+3x)}-$$

$$\frac{9\,(1+x)}{2\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}\,(4+3x)}{\sqrt{3}\,\left(28+54x+27x^2\right)^{1/3}}\right]}{6\times 2^{2/3}\sqrt{3}}+$$

$$\left(\sqrt{2+\sqrt{3}}\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(72\sqrt{2}\,3^{1/4}\,(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(\left(6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)\sqrt{\frac{1+\left(28+54x+27x^2\right)^{1/3}+\left(28+54x+27x^2\right)^{2/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{6\left(1+\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(36\times 3^{3/4}\,(1+x)\sqrt{-\frac{6-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}}{\left(6\left(1-\sqrt{3}\right)-2^{1/3}\left(108+(54+54x)^2\right)^{1/3}\right)^2}}\right)+$$

$$\frac{\text{Log}[2+3x]}{12\times 2^{2/3}}-\frac{\text{Log}\left[-108-81x+27\times 2^{1/3}\left(28+54x+27x^2\right)^{1/3}\right]}{12\times 2^{2/3}}$$

Result (type 6, 405 leaves) :

$$\left(-\frac{36\,\left(28+54\,x+27\,x^2\right)^2}{2+3\,x}+\left(540\,\left(2+3\,x\right)\,\left(9-\mathrm{i}\,\sqrt{3}+9\,x\right)\right.\right.$$
$$\left.\left(9+\mathrm{i}\,\sqrt{3}+9\,x\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]\right)\Big/$$
$$\left(15\,\left(2+3\,x\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]+\right.$$
$$\mathrm{i}\,\left(3\,\mathrm{i}+\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]+$$
$$\left.\left(-3-\mathrm{i}\,\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]\right)+$$
$$3\times 2^{2/3}\times 3^{5/6}\,\left(-9\,\mathrm{i}+\sqrt{3}-9\,\mathrm{i}\,x\right)^{1/3}\,\left(9-\mathrm{i}\,\sqrt{3}+9\,x\right)\,\left(28+54\,x+27\,x^2\right)$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{9\,\mathrm{i}+\sqrt{3}+9\,\mathrm{i}\,x}{2\,\sqrt{3}}\right]\right)\Big/\left(432\,\left(28+54\,x+27\,x^2\right)^{4/3}\right)$$

Problem 2508: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(2+3\,x\right)^3\,\left(28+54\,x+27\,x^2\right)^{1/3}}\,dx$$

Optimal (type 4, 696 leaves, 9 steps):

$$-\frac{\left(28+54\,x+27\,x^2\right)^{2/3}}{24\,\left(2+3\,x\right)^2}+\frac{\left(28+54\,x+27\,x^2\right)^{2/3}}{12\,\left(2+3\,x\right)}+$$

$$\frac{9\,\left(1+x\right)}{2\,\left(6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2^{2/3}\,\left(4+3\,x\right)}{\sqrt{3}\,\left(28+54\,x+27\,x^2\right)^{1/3}}\right]}{12\times 2^{2/3}\,\sqrt{3}}-$$

$$\left(\sqrt{2+\sqrt{3}}\,\left(6-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)\,\sqrt{\frac{1+\left(28+54\,x+27\,x^2\right)^{1/3}+\left(28+54\,x+27\,x^2\right)^{2/3}}{\left(6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{6\,\left(1+\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}{6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(72\,\sqrt{2}\,3^{1/4}\,\left(1+x\right)\,\sqrt{-\frac{6-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}{\left(6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(6-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)\,\sqrt{\frac{1+\left(28+54\,x+27\,x^2\right)^{1/3}+\left(28+54\,x+27\,x^2\right)^{2/3}}{\left(6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{6\,\left(1+\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}{6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(36\times 3^{3/4}\,\left(1+x\right)\,\sqrt{-\frac{6-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}}{\left(6\,\left(1-\sqrt{3}\right)-2^{1/3}\,\left(108+\left(54+54\,x\right)^2\right)^{1/3}\right)^2}}\right)-$$

$$\frac{\text{Log}\left[2+3\,x\right]}{24\times 2^{2/3}}+\frac{\text{Log}\left[-108-81\,x+27\times 2^{1/3}\,\left(28+54\,x+27\,x^2\right)^{1/3}\right]}{24\times 2^{2/3}}$$

Result (type 6, 412 leaves):

$$\left(\frac{54\,(1+2\,x)\,\left(28+54\,x+27\,x^2\right)^2}{(2+3\,x)^2}-\left(270\,(2+3\,x)\,\left(9-\mathrm{i}\,\sqrt{3}+9\,x\right)\right.\right.$$
$$\left.\left(9+\mathrm{i}\,\sqrt{3}+9\,x\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]\right)\Big/$$
$$\left(15\,(2+3\,x)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]+\right.$$
$$\mathrm{i}\,\left(3\,\mathrm{i}+\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]+$$
$$\left.\left(-3-\mathrm{i}\,\sqrt{3}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},-\frac{3+\mathrm{i}\,\sqrt{3}}{6+9\,x},\frac{-3+\mathrm{i}\,\sqrt{3}}{6+9\,x}\right]\right)+$$
$$3\,\mathrm{i}\,2^{2/3}\times 3^{5/6}\,\left(-9\,\mathrm{i}+\sqrt{3}-9\,\mathrm{i}\,x\right)^{1/3}\,\left(9\,\mathrm{i}+\sqrt{3}+9\,\mathrm{i}\,x\right)\,\left(28+54\,x+27\,x^2\right)$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{9\,\mathrm{i}+\sqrt{3}+9\,\mathrm{i}\,x}{2\,\sqrt{3}}\right]\right)\Big/\left(432\,\left(28+54\,x+27\,x^2\right)^{4/3}\right)$$

Problem 2509: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+e\,x)\,\left(-c^2\,d^2+b\,c\,d\,e+2\,b^2\,e^2+9\,b\,c\,e^2\,x+9\,c^2\,e^2\,x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 564 leaves, 2 steps):

$$-\left(\left(\sqrt{3}\,\left(-c\,e\,(c\,d-2\,b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\,\left(c\,e\,(c\,d+b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\right.\right.$$
$$\left.\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2^{1/3}\,\left(-c\,e\,(c\,d-2\,b\,e)+3\,c^2\,e^2\,x\right)^{2/3}}{\sqrt{3}\,c^{1/3}\,e^{1/3}\,(2\,c\,d-b\,e)^{1/3}\,\left(c\,e\,(c\,d+b\,e)+3\,c^2\,e^2\,x\right)^{1/3}}\right]\right)\Big/$$
$$\left.\left(2\times 2^{1/3}\,c^{2/3}\,e^{5/3}\,(2\,c\,d-b\,e)^{2/3}\,\left(-(c\,d-2\,b\,e)\,(c\,d+b\,e)+9\,b\,c\,e^2\,x+9\,c^2\,e^2\,x^2\right)^{1/3}\right)\right)-$$
$$\left(\left(-c\,e\,(c\,d-2\,b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\,\left(c\,e\,(c\,d+b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\,\text{Log}[d+e\,x]\right)\Big/$$
$$\left(2\times 2^{1/3}\,c^{2/3}\,e^{5/3}\,(2\,c\,d-b\,e)^{2/3}\,\left(-(c\,d-2\,b\,e)\,(c\,d+b\,e)+9\,b\,c\,e^2\,x+9\,c^2\,e^2\,x^2\right)^{1/3}\right)+$$
$$\left(3\,\left(-c\,e\,(c\,d-2\,b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\,\left(c\,e\,(c\,d+b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\right.$$
$$\left.\text{Log}\left[-\frac{\left(\frac{3}{2}\right)^{1/3}\,\left(-c\,e\,(c\,d-2\,b\,e)+3\,c^2\,e^2\,x\right)^{2/3}}{c^{1/3}\,e^{1/3}\,(2\,c\,d-b\,e)^{1/3}}-6^{1/3}\,\left(c\,e\,(c\,d+b\,e)+3\,c^2\,e^2\,x\right)^{1/3}\right]\right)\Big/$$
$$\left(4\times 2^{1/3}\,c^{2/3}\,e^{5/3}\,(2\,c\,d-b\,e)^{2/3}\,\left(-(c\,d-2\,b\,e)\,(c\,d+b\,e)+9\,b\,c\,e^2\,x+9\,c^2\,e^2\,x^2\right)^{1/3}\right)$$

Result (type 6, 290 leaves):

$$-\left(\left(3^{1/3}\left(\frac{3\,b\,c\,e^2-\sqrt{c^2\,e^2\,\left(-2\,c\,d+b\,e\right)^2}+6\,c^2\,e^2\,x}{c^2\,e\,\left(d+e\,x\right)}\right)^{1/3}\left(\frac{3\,b\,c\,e^2+\sqrt{c^2\,e^2\,\left(-2\,c\,d+b\,e\right)^2}+6\,c^2\,e^2\,x}{c^2\,e\,\left(d+e\,x\right)}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{-6\,c^2\,d\,e+3\,b\,c\,e^2+\sqrt{c^2\,e^2\,\left(-2\,c\,d+b\,e\right)^2}}{6\,c^2\,e\,\left(d+e\,x\right)},\frac{6\,c^2\,d\,e-3\,b\,c\,e^2+\sqrt{c^2\,e^2\,\left(-2\,c\,d+b\,e\right)^2}}{6\,c^2\,e\,\left(d+e\,x\right)}\right]\right)\Big/\left(2\times 2^{2/3}\,e\,\left(2\,b^2\,e^2+b\,c\,e\,\left(d+9\,e\,x\right)-c^2\,\left(d^2-9\,e^2\,x^2\right)\right)^{1/3}\right)\right)$$

Problem 2510: Result unnecessarily involves higher level functions.

$$\int (d+e\,x)^3\,\left(a+b\,x+c\,x^2\right)^{1/4}\,dx$$

Optimal (type 4, 374 leaves, 5 steps):

$$\frac{1}{168\,c^4}\left(2\,c\,d-b\,e\right)\,\left(28\,c^2\,d^2+13\,b^2\,e^2-4\,c\,e\,\left(7\,b\,d+6\,a\,e\right)\right)\,\left(b+2\,c\,x\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}+\frac{2\,e\,\left(d+e\,x\right)^2\,\left(a+b\,x+c\,x^2\right)^{5/4}}{9\,c}+\frac{1}{630\,c^3}e\,\left(616\,c^2\,d^2+117\,b^2\,e^2-2\,c\,e\,\left(243\,b\,d+56\,a\,e\right)+130\,c\,e\,\left(2\,c\,d-b\,e\right)\,x\right)\,\left(a+b\,x+c\,x^2\right)^{5/4}-$$

$$\left(\left(b^2-4\,a\,c\right)^{5/4}\,\left(2\,c\,d-b\,e\right)\,\left(28\,c^2\,d^2+13\,b^2\,e^2-4\,c\,e\,\left(7\,b\,d+6\,a\,e\right)\right)\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(336\,\sqrt{2}\,c^{17/4}\,\left(b+2\,c\,x\right)\right)$$

Result (type 5, 376 leaves):

$$\frac{1}{672\left(a+x\left(b+c x\right)\right)^{3/4}}\left(\frac{1}{15 c^4}4\left(a+x\left(b+c x\right)\right)\left(-195 b^4 e^3+6 b^3 c e^2\left(135 d+13 e x\right)-4 b^2 c e\left(-207 a e^2+c\left(315 d^2+81 d e x+13 e^2 x^2\right)\right)+8 b c^2\left(-a e^2\left(333 d+31 e x\right)+c\left(105 d^3+63 d^2 e x+27 d e^2 x^2+5 e^3 x^3\right)\right)+16 c^2\left(-28 a^2 e^3+a c e\left(189 d^2+45 d e x+7 e^2 x^2\right)+c^2 x\left(105 d^3+189 d^2 e x+135 d e^2 x^2+35 e^3 x^3\right)\right)\right)+\frac{1}{c^5}2^{1/4}\left(b^2-4 a c\right)\left(-2 c d+b e\right)\left(28 c^2 d^2+13 b^2 e^2-4 c e\left(7 b d+6 a e\right)\right)\left(b-\sqrt{b^2-4 a c}+2 c x\right)\left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4 a c}-2 c x}{2\sqrt{b^2-4 a c}}\right]\right)$$

Problem 2511: Result unnecessarily involves higher level functions.

$$\int\left(d+e x\right)^2\left(a+b x+c x^2\right)^{1/4}dx$$

Optimal (type 4, 319 leaves, 5 steps):

$$\frac{\left(28 c^2 d^2+9 b^2 e^2-4 c e\left(7 b d+2 a e\right)\right)\left(b+2 c x\right)\left(a+b x+c x^2\right)^{1/4}}{84 c^3}+\frac{9 e\left(2 c d-b e\right)\left(a+b x+c x^2\right)^{5/4}}{35 c^2}+\frac{2 e\left(d+e x\right)\left(a+b x+c x^2\right)^{5/4}}{7 c}-\left(\left(b^2-4 a c\right)^{5/4}\left(28 c^2 d^2+9 b^2 e^2-4 c e\left(7 b d+2 a e\right)\right)\sqrt{\frac{\left(b+2 c x\right)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(168\sqrt{2}\,c^{13/4}\left(b+2 c x\right)\right)$$

Result (type 5, 274 leaves):

$$\frac{1}{1680\,c^4\,(a+x\,(b+c\,x))^{3/4}}\Bigg(4\,c\,(a+x\,(b+c\,x))\,\big(45\,b^3\,e^2-2\,b^2\,c\,e\,(70\,d+9\,e\,x)+4\,b\,c\,\big(-37\,a\,e^2+c\,(35\,d^2+14\,d\,e\,x+3\,e^2\,x^2)\big)+8\,c^2\,\big(a\,e\,(42\,d+5\,e\,x)+c\,x\,(35\,d^2+42\,d\,e\,x+15\,e^2\,x^2)\big)\big)-5\times 2^{1/4}\,(b^2-4\,a\,c)\,\big(28\,c^2\,d^2+9\,b^2\,e^2-4\,c\,e\,(7\,b\,d+2\,a\,e)\big)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\Bigg)$$

Problem 2512: Result unnecessarily involves higher level functions.

$$\int (d+e\,x)\,(a+b\,x+c\,x^2)^{1/4}\,dx$$

Optimal (type 4, 241 leaves, 4 steps):

$$\frac{(2\,c\,d-b\,e)\,(b+2\,c\,x)\,(a+b\,x+c\,x^2)^{1/4}}{6\,c^2}+\frac{2\,e\,(a+b\,x+c\,x^2)^{5/4}}{5\,c}-\left((b^2-4\,a\,c)^{5/4}\,(2\,c\,d-b\,e)\,\sqrt{\frac{(b+2\,c\,x)^2}{(b^2-4\,a\,c)\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+b\,x+c\,x^2)^{1/4}}{(b^2-4\,a\,c)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(12\,\sqrt{2}\,c^{9/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 194 leaves):

$$\Bigg(4\,c\,(a+x\,(b+c\,x))\,\big(-5\,b^2\,e+2\,b\,c\,(5\,d+e\,x)+4\,c\,(3\,a\,e+c\,x\,(5\,d+3\,e\,x))\big)+5\times 2^{1/4}\,(b^2-4\,a\,c)\,(-2\,c\,d+b\,e)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/\left(120\,c^3\,(a+x\,(b+c\,x))^{3/4}\right)$$

Problem 2513: Result unnecessarily involves higher level functions.

$$\int (a+b\,x+c\,x^2)^{1/4}\,dx$$

Optimal (type 4, 201 leaves, 3 steps):

$$\frac{(b+2cx)\left(a+bx+cx^2\right)^{1/4}}{3c}-$$

$$\left((b^2-4ac)^{5/4}\sqrt{\frac{(b+2cx)^2}{(b^2-4ac)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+bx+cx^2\right)^{1/4}}{(b^2-4ac)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(6\sqrt{2}\,c^{5/4}(b+2cx)\right)$$

Result (type 5, 155 leaves):

$$\left(4c(b+2cx)(a+x(b+cx))-2^{1/4}(b^2-4ac)\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{3/4}\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)\Big/\left(12c^2(a+x(b+cx))^{3/4}\right)$$

Problem 2514: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+bx+cx^2\right)^{1/4}}{d+ex}\,dx$$

Optimal (type 4, 881 leaves, 19 steps):

$$\frac{2\left(a+b x+c x^2\right)^{1/4}}{e}-\left(\left(-b^2+4 a c\right)^{3/4}\left(c d^2-b d e+a e^2\right)^{1/4}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/\left(c^{3/4} e^{3/2}\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(\left(-b^2+4 a c\right)^{3/4}\left(c d^2-b d e+a e^2\right)^{1/4}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/\left(c^{3/4} e^{3/2}\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(\left(b^2-4 a c\right)^{1/4}(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\, c^{1/4} e^2 (b+2 c x)\right)-$$

$$\left(\left(b^2-4 a c\right)(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\; e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\, c e^2 (b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(\left(b^2-4 a c\right)(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\; e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\, c e^2 (b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 6, 178 leaves) :

$$\left(2\sqrt{2}\,\left(a+x\,(b+c\,x)\right)^{1/4}\right.$$
$$\left.\text{AppellF1}\left[-\frac{1}{2},-\frac{1}{4},-\frac{1}{4},\frac{1}{2},\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}{2\,c\,(d+e\,x)},\frac{2\,c\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d+2\,c\,e\,x}\right]\right)\Big/$$
$$\left(e\left(\frac{e\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\,(d+e\,x)}\right)^{1/4}\left(\frac{e\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\,(d+e\,x)}\right)^{1/4}\right)$$

Problem 2515: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{1/4}}{(d+e\,x)^2}\,dx$$

Optimal (type 4, 944 leaves, 19 steps):

$$-\frac{\left(a+b x+c x^2\right)^{1/4}}{e\,(d+e x)}+\left(\left(-b^2+4 a c\right)^{3/4}(2 c d-b e)\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/\left(4 c^{3/4} e^{3/2}\left(c d^2-b d e+a e^2\right)^{3/4}\left(a+b x+c x^2\right)^{3/4}\right)+\left(\left(-b^2+4 a c\right)^{3/4}(2 c d-b e)\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/\left(4 c^{3/4} e^{3/2}\left(c d^2-b d e+a e^2\right)^{3/4}\left(a+b x+c x^2\right)^{3/4}\right)+\frac{1}{\sqrt{2}\,e^2\,(b+2 c x)}c^{3/4}\left(b^2-4 a c\right)^{1/4}\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]+\left(\left(b^2-4 a c\right)(2 c d-b e)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\;e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/\left(4\sqrt{2}\,c\,e^2\left(c d^2-b d e+a e^2\right)(b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)+\left(\left(b^2-4 a c\right)(2 c d-b e)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\;e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/\left(4\sqrt{2}\,c\,e^2\left(c d^2-b d e+a e^2\right)(b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 6, 185 leaves) :

$$-\left(\left(2\sqrt{2}\,\left(a+x\,(b+c\,x)\right)^{1/4}\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{4},-\frac{1}{4},\frac{3}{2},\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}{2\,c\,(d+e\,x)},\frac{2\,c\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d+2\,c\,e\,x}\right]\right)\Bigg/\left(e\left(\frac{e\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\,(d+e\,x)}\right)^{1/4}\left(\frac{e\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\,(d+e\,x)}\right)^{1/4}(d+e\,x)\right)\right)$$

Problem 2516: Result unnecessarily involves higher level functions.

$$\int (d+e\,x)^3\,\left(a+b\,x+c\,x^2\right)^{3/4}\,dx$$

Optimal (type 4, 703 leaves, 7 steps) :

$$\frac{1}{120\,c^4}(2\,c\,d-b\,e)\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,(3\,b\,d+2\,a\,e)\right)(b+2\,c\,x)\left(a+b\,x+c\,x^2\right)^{3/4}+$$

$$\frac{2\,e\,(d+e\,x)^2\left(a+b\,x+c\,x^2\right)^{7/4}}{11\,c}+\frac{1}{462\,c^3}$$

$$e\left(312\,c^2\,d^2+55\,b^2\,e^2-2\,c\,e\,(121\,b\,d+24\,a\,e)+70\,c\,e\,(2\,c\,d-b\,e)\,x\right)\left(a+b\,x+c\,x^2\right)^{7/4}-$$

$$\left(\sqrt{b^2-4\,a\,c}\;(2\,c\,d-b\,e)\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,(3\,b\,d+2\,a\,e)\right)(b+2\,c\,x)\left(a+b\,x+c\,x^2\right)^{1/4}\right)\Big/$$

$$\left(80\,c^{9/2}\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right)+$$

$$\left(\left(b^2-4\,a\,c\right)^{7/4}(2\,c\,d-b\,e)\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,(3\,b\,d+2\,a\,e)\right)\right.$$

$$\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(80\,\sqrt{2}\,c^{19/4}\,(b+2\,c\,x)\right)-$$

$$\left(\left(b^2-4\,a\,c\right)^{7/4}(2\,c\,d-b\,e)\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,(3\,b\,d+2\,a\,e)\right)\right.$$

$$\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(160\,\sqrt{2}\,c^{19/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 377 leaves) :

$$\frac{1}{480\,\left(a+x\,\left(b+c\,x\right)\right)^{1/4}}\left(\frac{1}{77\,c^4}4\,\left(a+x\,\left(b+c\,x\right)\right)\right.$$
$$\left(-385\,b^4\,e^3+22\,b^3\,c\,e^2\,\left(77\,d+15\,e\,x\right)-12\,b^2\,c\,e\,\left(-143\,a\,e^2+c\,\left(231\,d^2+121\,d\,e\,x+25\,e^2\,x^2\right)\right)+\right.$$
$$8\,b\,c^2\,\left(-3\,a\,e^2\,\left(253\,d+47\,e\,x\right)+c\,\left(231\,d^3+297\,d^2\,e\,x+165\,d\,e^2\,x^2+35\,e^3\,x^3\right)\right)+$$
$$16\,c^2\,\left(-60\,a^2\,e^3+3\,a\,c\,e\,\left(165\,d^2+77\,d\,e\,x+15\,e^2\,x^2\right)+\right.$$
$$\left.\left.c^2\,x\,\left(231\,d^3+495\,d^2\,e\,x+385\,d\,e^2\,x^2+105\,e^3\,x^3\right)\right)\right)+$$
$$\frac{1}{c^5}2^{3/4}\,\left(b^2-4\,a\,c\right)\,\left(-2\,c\,d+b\,e\right)\,\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,\left(3\,b\,d+2\,a\,e\right)\right)$$
$$\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)$$

Problem 2517: Result unnecessarily involves higher level functions.

$$\int\left(d+e\,x\right)^2\,\left(a+b\,x+c\,x^2\right)^{3/4}\,dx$$

Optimal (type 4, 630 leaves, 7 steps):

$$\frac{\left(36 c^2 d^2 + 11 b^2 e^2 - 4 c e (9 b d + 2 a e)\right) (b + 2 c x) \left(a + b x + c x^2\right)^{3/4}}{180 c^3} + \frac{11 e (2 c d - b e) \left(a + b x + c x^2\right)^{7/4}}{63 c^2} + \frac{2 e (d + e x) \left(a + b x + c x^2\right)^{7/4}}{9 c} - \left(\sqrt{b^2 - 4 a c} \left(36 c^2 d^2 + 11 b^2 e^2 - 4 c e (9 b d + 2 a e)\right) (b + 2 c x) \left(a + b x + c x^2\right)^{1/4}\right) \Big/ \left(120 c^{7/2} \left(1 + \frac{2 \sqrt{c} \sqrt{a + b x + c x^2}}{\sqrt{b^2 - 4 a c}}\right)\right) + \left(\left(b^2 - 4 a c\right)^{7/4} \left(36 c^2 d^2 + 11 b^2 e^2 - 4 c e (9 b d + 2 a e)\right) \sqrt{\frac{(b + 2 c x)^2}{\left(b^2 - 4 a c\right) \left(1 + \frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1 + \frac{2 \sqrt{c} \sqrt{a + b x + c x^2}}{\sqrt{b^2 - 4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a + b x + c x^2\right)^{1/4}}{\left(b^2 - 4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(120 \sqrt{2} c^{15/4} (b + 2 c x)\right) - \left(\left(b^2 - 4 a c\right)^{7/4} \left(36 c^2 d^2 + 11 b^2 e^2 - 4 c e (9 b d + 2 a e)\right) \sqrt{\frac{(b + 2 c x)^2}{\left(b^2 - 4 a c\right) \left(1 + \frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1 + \frac{2 \sqrt{c} \sqrt{a + b x + c x^2}}{\sqrt{b^2 - 4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a + b x + c x^2\right)^{1/4}}{\left(b^2 - 4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(240 \sqrt{2} c^{15/4} (b + 2 c x)\right)$$

Result (type 5, 275 leaves) :

$$\frac{1}{5040\,c^4\,\left(a+x\,\left(b+c\,x\right)\right)^{1/4}}\left(4\,c\,\left(a+x\,\left(b+c\,x\right)\right)\left(77\,b^3\,e^2-6\,b^2\,c\,e\,\left(42\,d+11\,e\,x\right)+12\,b\,c\,\left(-23\,a\,e^2+c\,\left(21\,d^2+18\,d\,e\,x+5\,e^2\,x^2\right)\right)+8\,c^2\,\left(3\,a\,e\,\left(30\,d+7\,e\,x\right)+c\,x\,\left(63\,d^2+90\,d\,e\,x+35\,e^2\,x^2\right)\right)\right)-7\times 2^{3/4}\,\left(b^2-4\,a\,c\right)\,\left(36\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,\left(9\,b\,d+2\,a\,e\right)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)$$

Problem 2518: Result unnecessarily involves higher level functions.

$$\int\left(d+e\,x\right)\,\left(a+b\,x+c\,x^2\right)^{3/4}\,dx$$

Optimal (type 4, 510 leaves, 6 steps):

$$\frac{\left(2\,c\,d-b\,e\right)\,\left(b+2\,c\,x\right)\,\left(a+b\,x+c\,x^2\right)^{3/4}}{10\,c^2}+\frac{2\,e\,\left(a+b\,x+c\,x^2\right)^{7/4}}{7\,c}-\frac{3\,\sqrt{b^2-4\,a\,c}\,\left(2\,c\,d-b\,e\right)\,\left(b+2\,c\,x\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{20\,c^{5/2}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}+$$
$$\left(3\,\left(b^2-4\,a\,c\right)^{7/4}\,\left(2\,c\,d-b\,e\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(20\,\sqrt{2}\,c^{11/4}\,\left(b+2\,c\,x\right)\right)-$$
$$\left(3\,\left(b^2-4\,a\,c\right)^{7/4}\,\left(2\,c\,d-b\,e\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(40\,\sqrt{2}\,c^{11/4}\,\left(b+2\,c\,x\right)\right)$$

Result (type 5, 195 leaves):

$$\left(4 c \left(a+x \left(b+c x\right)\right) \left(-7 b^2 e+2 b c \left(7 d+3 e x\right)+4 c \left(5 a e+c x \left(7 d+5 e x\right)\right)\right)+ 7\times 2^{3/4} \left(b^2-4 a c\right) \left(-2 c d+b e\right) \left(b-\sqrt{b^2-4 a c}+2 c x\right) \left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4 a c}-2 c x}{2 \sqrt{b^2-4 a c}}\right]\right) \Big/ \left(280 c^3 \left(a+x \left(b+c x\right)\right)^{1/4}\right)$$

Problem 2519: Result unnecessarily involves higher level functions.

$$\int \left(a+b x+c x^2\right)^{3/4} dx$$

Optimal (type 4, 452 leaves, 5 steps):

$$\frac{\left(b+2 c x\right) \left(a+b x+c x^2\right)^{3/4}}{5 c}-\frac{3 \sqrt{b^2-4 a c} \left(b+2 c x\right) \left(a+b x+c x^2\right)^{1/4}}{10 c^{3/2} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)}+ \left(3 \left(b^2-4 a c\right)^{7/4} \sqrt{\frac{\left(b+2 c x\right)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right) \Big/ \left(10 \sqrt{2} c^{7/4} \left(b+2 c x\right)\right)- \left(3 \left(b^2-4 a c\right)^{7/4} \sqrt{\frac{\left(b+2 c x\right)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right) \Big/ \left(20 \sqrt{2} c^{7/4} \left(b+2 c x\right)\right)$$

Result (type 5, 155 leaves):

$$\left(4\,c\,(b+2\,c\,x)\,(a+x\,(b+c\,x))-2^{3/4}\,(b^2-4\,a\,c)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(20\,c^2\,(a+x\,(b+c\,x))^{1/4}\right)$$

Problem 2520: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x+c\,x^2)^{3/4}}{d+e\,x}\,dx$$

Optimal (type 4, 1209 leaves, 20 steps):

$$\frac{2\,(a+b\,x+c\,x^2)^{3/4}}{3\,e}-\frac{(2\,c\,d-b\,e)\,(b+2\,c\,x)\,(a+b\,x+c\,x^2)^{1/4}}{\sqrt{c}\,\sqrt{b^2-4\,a\,c}\,e^2\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}+$$
$$\left((-b^2+4\,a\,c)^{1/4}\,(c\,d^2-b\,d\,e+a\,e^2)^{3/4}\left(-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}\right)^{1/4}\right.$$
$$\left.\text{ArcTan}\left[\frac{(-b^2+4\,a\,c)^{1/4}\,\sqrt{e}\,\left(1-\frac{(b+2\,c\,x)^2}{b^2-4\,a\,c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\,(c\,d^2-b\,d\,e+a\,e^2)^{1/4}}\right]\right)\Big/\left(c^{1/4}\,e^{5/2}\,(a+b\,x+c\,x^2)^{1/4}\right)-$$
$$\left((-b^2+4\,a\,c)^{1/4}\,(c\,d^2-b\,d\,e+a\,e^2)^{3/4}\left(-\frac{c\,(a+b\,x+c\,x^2)}{b^2-4\,a\,c}\right)^{1/4}\right.$$
$$\left.\text{ArcTanh}\left[\frac{(-b^2+4\,a\,c)^{1/4}\,\sqrt{e}\,\left(1-\frac{(b+2\,c\,x)^2}{b^2-4\,a\,c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\,(c\,d^2-b\,d\,e+a\,e^2)^{1/4}}\right]\right)\Big/\left(c^{1/4}\,e^{5/2}\,(a+b\,x+c\,x^2)^{1/4}\right)+$$
$$\left((b^2-4\,a\,c)^{3/4}\,(2\,c\,d-b\,e)\,\sqrt{\frac{(b+2\,c\,x)^2}{(b^2-4\,a\,c)\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$
$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+b\,x+c\,x^2)^{1/4}}{(b^2-4\,a\,c)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,c^{3/4}\,e^2\,(b+2\,c\,x)\right)-$$
$$\left((b^2-4\,a\,c)^{3/4}\,(2\,c\,d-b\,e)\,\sqrt{\frac{(b+2\,c\,x)^2}{(b^2-4\,a\,c)\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2\sqrt{2}\,c^{3/4}\,e^2\left(b+2\,c\,x\right)\right)-$$

$$\left(\sqrt{-b^2+4\,a\,c}\,\left(2\,c\,d-b\,e\right)\sqrt{c\,d^2-b\,d\,e+a\,e^2}\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{b^2-4\,a\,c}}\,\left(-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4\,a\,c}\,e}{2\sqrt{c}\,\sqrt{c\,d^2-b\,d\,e+a\,e^2}},\text{ArcSin}\left[\left(1-\frac{\left(b+2\,c\,x\right)^2}{b^2-4\,a\,c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{c}\,e^3\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{1/4}\right)+$$

$$\left(\sqrt{-b^2+4\,a\,c}\,\left(2\,c\,d-b\,e\right)\sqrt{c\,d^2-b\,d\,e+a\,e^2}\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{b^2-4\,a\,c}}\,\left(-\frac{c\left(a+b\,x+c\,x^2\right)}{b^2-4\,a\,c}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4\,a\,c}\,e}{2\sqrt{c}\,\sqrt{c\,d^2-b\,d\,e+a\,e^2}},\text{ArcSin}\left[\left(1-\frac{\left(b+2\,c\,x\right)^2}{b^2-4\,a\,c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{c}\,e^3\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{1/4}\right)$$

Result (type 6, 180 leaves):

$$\left(4\sqrt{2}\,\left(a+x\left(b+c\,x\right)\right)^{3/4}\right.$$

$$\left.\text{AppellF1}\left[-\frac{3}{2},-\frac{3}{4},-\frac{3}{4},-\frac{1}{2},\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}{2\,c\left(d+e\,x\right)},\frac{2\,c\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d+2\,c\,e\,x}\right]\right)\Big/$$

$$\left(3\,e\left(\frac{e\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\left(d+e\,x\right)}\right)^{3/4}\left(\frac{e\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{c\left(d+e\,x\right)}\right)^{3/4}\right)$$

Problem 2521: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,x+c\,x^2\right)^{3/4}}{\left(d+e\,x\right)^2}\,dx$$

Optimal (type 4, 1220 leaves, 20 steps):

$$-\frac{\left(a+b\,x+c\,x^2\right)^{3/4}}{e\left(d+e\,x\right)}+\frac{3\sqrt{c}\,\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{1/4}}{\sqrt{b^2-4\,a\,c}\,e^2\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-$$

$$\left(3\left(-b^2+4ac\right)^{1/4}(2cd-be)\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{ArcTan}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(4c^{1/4}e^{5/2}\left(cd^2-bde+ae^2\right)^{1/4}\left(a+bx+cx^2\right)^{1/4}\right)+\left(3\left(-b^2+4ac\right)^{1/4}(2cd-be)\right.$$

$$\left.\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\text{ArcTanh}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(4c^{1/4}e^{5/2}\left(cd^2-bde+ae^2\right)^{1/4}\left(a+bx+cx^2\right)^{1/4}\right)-\frac{1}{\sqrt{2}\,e^2\,(b+2cx)}$$

$$3c^{1/4}\left(b^2-4ac\right)^{3/4}\sqrt{\frac{(b+2cx)^2}{\left(b^2-4ac\right)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)$$

$$\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+bx+cx^2\right)^{1/4}}{\left(b^2-4ac\right)^{1/4}}\right],\frac{1}{2}\right]+$$

$$\left(3c^{1/4}\left(b^2-4ac\right)^{3/4}\sqrt{\frac{(b+2cx)^2}{\left(b^2-4ac\right)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+bx+cx^2\right)^{1/4}}{\left(b^2-4ac\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2\sqrt{2}\,e^2\,(b+2cx)\right)+$$

$$\left(3\sqrt{-b^2+4ac}\,(2cd-be)^2\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\sqrt{c}\,e^3\sqrt{cd^2-bde+ae^2}\,(b+2cx)\left(a+bx+cx^2\right)^{1/4}\right)-$$

$$\left(3\sqrt{-b^2+4ac}\,(2cd-be)^2\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\,(a+bx+cx^2)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\,\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\,\sqrt{c}\,e^3\sqrt{cd^2-bde+ae^2}\,(b+2cx)\,(a+bx+cx^2)^{1/4}\right)$$

Result (type 6, 185 leaves):

$$\left(4\sqrt{2}\,(a+x\,(b+cx))^{3/4}\right.$$

$$\left.\text{AppellF1}\left[-\frac{1}{2},-\frac{3}{4},-\frac{3}{4},\frac{1}{2},\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2c\,(d+ex)},\frac{2cd-be+\sqrt{b^2-4ac}\;e}{2cd+2cex}\right]\right)\Big/$$

$$\left(e\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{3/4}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{3/4}(d+ex)\right)$$

Problem 2522: Result unnecessarily involves higher level functions.

$$\int (d+ex)^3\,(a+bx+cx^2)^{5/4}\,dx$$

Optimal (type 4, 448 leaves, 6 steps):

$$-\frac{1}{7392\,c^5}5\left(b^2-4\,a\,c\right)\left(2\,c\,d-b\,e\right)\left(44\,c^2\,d^2+17\,b^2\,e^2-4\,c\,e\left(11\,b\,d+6\,a\,e\right)\right)\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{1/4}+\frac{1}{616\,c^4}\left(2\,c\,d-b\,e\right)\left(44\,c^2\,d^2+17\,b^2\,e^2-4\,c\,e\left(11\,b\,d+6\,a\,e\right)\right)\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{5/4}+\frac{2\,e\left(d+e\,x\right)^2\left(a+b\,x+c\,x^2\right)^{9/4}}{13\,c}+\frac{1}{2574\,c^3}e\left(1320\,c^2\,d^2+221\,b^2\,e^2-2\,c\,e\left(507\,b\,d+88\,a\,e\right)+306\,c\,e\left(2\,c\,d-b\,e\right)x\right)\left(a+b\,x+c\,x^2\right)^{9/4}+\left(5\left(b^2-4\,a\,c\right)^{9/4}\left(2\,c\,d-b\,e\right)\left(44\,c^2\,d^2+17\,b^2\,e^2-4\,c\,e\left(11\,b\,d+6\,a\,e\right)\right)\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(14784\sqrt{2}\,c^{21/4}\left(b+2\,c\,x\right)\right)$$

Result (type 5, 590 leaves):

$$\frac{1}{1153152\,c^6\left(a+x\left(b+c\,x\right)\right)^{3/4}}\left(-4\,c\left(a+x\left(b+c\,x\right)\right)\left(-3315\,b^6\,e^3+78\,b^5\,c\,e^2\left(195\,d+17\,e\,x\right)-52\,b^4\,c\,e\left(-498\,a\,e^2+c\left(495\,d^2+117\,d\,e\,x+17\,e^2\,x^2\right)\right)-16\,b^2\,c^2\left(3419\,a^2\,e^3-2\,a\,c\,e\left(5148\,d^2+1131\,d\,e\,x+158\,e^2\,x^2\right)+c^2\,x\left(429\,d^3+429\,d^2\,e\,x+195\,d\,e^2\,x^2+35\,e^3\,x^3\right)\right)+8\,b^3\,c^2\left(-26\,a\,e^2\left(513\,d+43\,e\,x\right)+c\left(2145\,d^3+1287\,d^2\,e\,x+507\,d\,e^2\,x^2+85\,e^3\,x^3\right)\right)-64\,c^3\left(-308\,a^3\,e^3+a^2\,c\,e\left(3003\,d^2+585\,d\,e\,x+77\,e^2\,x^2\right)+3\,c^3\,x^3\left(429\,d^3+1001\,d^2\,e\,x+819\,d\,e^2\,x^2+231\,e^3\,x^3\right)+2\,a\,c^2\,x\left(1716\,d^3+3003\,d^2\,e\,x+2106\,d\,e^2\,x^2+539\,e^3\,x^3\right)\right)+32\,b\,c^3\left(a^2\,e^2\left(5421\,d+431\,e\,x\right)-4\,a\,c\left(858\,d^3+429\,d^2\,e\,x+156\,d\,e^2\,x^2+25\,e^3\,x^3\right)-3\,c^2\,x^2\left(1287\,d^3+2717\,d^2\,e\,x+2093\,d\,e^2\,x^2+567\,e^3\,x^3\right)\right)\right)+195\times2^{1/4}\left(b^2-4\,a\,c\right)^2\left(2\,c\,d-b\,e\right)\left(44\,c^2\,d^2+17\,b^2\,e^2-4\,c\,e\left(11\,b\,d+6\,a\,e\right)\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\sqrt{b^2-4\,a\,c}}\right]\right)$$

Problem 2523: Result unnecessarily involves higher level functions.

$$\int (d+e x)^2 \left(a+b x+c x^2\right)^{5/4} \, dx$$

Optimal (type 4, 384 leaves, 6 steps):

$$-\frac{1}{3696 c^4} 5 \left(b^2-4 a c\right) \left(44 c^2 d^2+13 b^2 e^2-4 c e (11 b d+2 a e)\right) (b+2 c x) \left(a+b x+c x^2\right)^{1/4}+\frac{\left(44 c^2 d^2+13 b^2 e^2-4 c e (11 b d+2 a e)\right) (b+2 c x) \left(a+b x+c x^2\right)^{5/4}}{308 c^3}+\frac{13 e (2 c d-b e) \left(a+b x+c x^2\right)^{9/4}}{99 c^2}+\frac{2 e (d+e x) \left(a+b x+c x^2\right)^{9/4}}{11 c}+\left(5 \left(b^2-4 a c\right)^{9/4} \left(44 c^2 d^2+13 b^2 e^2-4 c e (11 b d+2 a e)\right) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(7392 \sqrt{2} c^{17/4} (b+2 c x)\right)$$

Result (type 5, 416 leaves):

$$\frac{1}{44352 c^5 (a+x (b+c x))^{3/4}} \left(-4 c (a+x (b+c x)) \left(195 b^5 e^2-6 b^4 c e (110 d+13 e x)+8 b^2 c^2 \left(2 a e (264 d+29 e x)-c x \left(33 d^2+22 d e x+5 e^2 x^2\right)\right)+4 b^3 c \left(-342 a e^2+c \left(165 d^2+66 d e x+13 e^2 x^2\right)\right)-32 c^3 \left(a^2 e (154 d+15 e x)+4 a c x \left(66 d^2+77 d e x+27 e^2 x^2\right)+c^2 x^3 \left(99 d^2+154 d e x+63 e^2 x^2\right)\right)-16 b c^2 \left(-139 a^2 e^2+8 a c \left(33 d^2+11 d e x+2 e^2 x^2\right)+c^2 x^2 \left(297 d^2+418 d e x+161 e^2 x^2\right)\right)\right)+15\times 2^{1/4} \left(b^2-4 a c\right)^2 \left(44 c^2 d^2+13 b^2 e^2-4 c e (11 b d+2 a e)\right) \left(b-\sqrt{b^2-4 a c}+2 c x\right) \left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{-b+\sqrt{b^2-4 a c}-2 c x}{2 \sqrt{b^2-4 a c}}\right]\right)$$

Problem 2524: Result unnecessarily involves higher level functions.

$$\int (d+e x)\left(a+b x+c x^2\right)^{5/4}\,dx$$

Optimal (type 4, 285 leaves, 5 steps):

$$-\frac{5\left(b^2-4 a c\right)(2 c d-b e)(b+2 c x)\left(a+b x+c x^2\right)^{1/4}}{168 c^3}+\frac{(2 c d-b e)(b+2 c x)\left(a+b x+c x^2\right)^{5/4}}{14 c^2}+\frac{2 e\left(a+b x+c x^2\right)^{9/4}}{9 c}+\left(5\left(b^2-4 a c\right)^{9/4}(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(336\sqrt{2}\,c^{13/4}(b+2 c x)\right)$$

Result (type 5, 270 leaves):

$$\frac{1}{2016 c^4 (a+x (b+c x))^{3/4}}\left(-4 c (a+x (b+c x))\left(-15 b^4 e+6 b^3 c (5 d+e x)-4 b^2 c (-24 a e+c x (3 d+e x))-16 c^2\left(7 a^2 e+c^2 x^3 (9 d+7 e x)+2 a c x (12 d+7 e x)\right)-8 b c^2\left(4 a (6 d+e x)+c x^2 (27 d+19 e x)\right)\right)-15\times 2^{1/4}\left(b^2-4 a c\right)^2(-2 c d+b e)\left(b-\sqrt{b^2-4 a c}+2 c x\right)\left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4 a c}-2 c x}{2\sqrt{b^2-4 a c}}\right]\right)$$

Problem 2525: Result unnecessarily involves higher level functions.

$$\int \left(a+b x+c x^2\right)^{5/4}\,dx$$

Optimal (type 4, 236 leaves, 4 steps):

$$-\frac{5\left(b^2-4ac\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{1/4}}{84c^2}+\frac{\left(b+2cx\right)\left(a+bx+cx^2\right)^{5/4}}{7c}+$$
$$\left(5\left(b^2-4ac\right)^{9/4}\sqrt{\frac{\left(b+2cx\right)^2}{\left(b^2-4ac\right)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\right.$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+bx+cx^2\right)^{1/4}}{\left(b^2-4ac\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(168\sqrt{2}\,c^{9/4}\left(b+2cx\right)\right)$$

Result (type 5, 181 leaves):

$$\left(4c\left(b+2cx\right)\left(a+x\left(b+cx\right)\right)\left(-5b^2+12bcx+4c\left(8a+3cx^2\right)\right)+\right.$$
$$5\times2^{1/4}\left(b^2-4ac\right)^2\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{3/4}$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)\Big/\left(336c^3\left(a+x\left(b+cx\right)\right)^{3/4}\right)$$

Problem 2526: Unable to integrate problem.

$$\int\frac{\left(a+bx+cx^2\right)^{5/4}}{d+ex}\,dx$$

Optimal (type 4, 1014 leaves, 20 steps):

$$\frac{1}{6ce^3}\left(12c^2d^2+b^2e^2-2ce\left(7bd-6ae\right)-2ce\left(2cd-be\right)x\right)\left(a+bx+cx^2\right)^{1/4}+$$
$$\frac{2\left(a+bx+cx^2\right)^{5/4}}{5e}-\left(\left(-b^2+4ac\right)^{3/4}\left(cd^2-bde+ae^2\right)^{5/4}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\right.$$
$$\left.\text{ArcTan}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/\left(c^{3/4}e^{7/2}\left(a+bx+cx^2\right)^{3/4}\right)-$$
$$\left(\left(-b^2+4ac\right)^{3/4}\left(cd^2-bde+ae^2\right)^{5/4}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\right.$$
$$\left.\text{ArcTanh}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/\left(c^{3/4}e^{7/2}\left(a+bx+cx^2\right)^{3/4}\right)-$$

$$\left(\left(b^2-4 a c\right)^{1/4} (2 c d-b e) \left(12 c^2 d^2-b^2 e^2-4 c e (3 b d-4 a e)\right)\right.$$

$$\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(12 \sqrt{2} c^{5/4} e^4 (b+2 c x)\right) -$$

$$\left(\left(b^2-4 a c\right) (2 c d-b e) \left(c d^2-b d e+a e^2\right) \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\, e}{2 \sqrt{c} \sqrt{c d^2-b d e+a e^2}}, \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right], -1\right]\right) \Big/$$

$$\left(\sqrt{2} c e^4 (b+2 c x) \left(a+b x+c x^2\right)^{3/4}\right) -$$

$$\left(\left(b^2-4 a c\right) (2 c d-b e) \left(c d^2-b d e+a e^2\right) \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\, e}{2 \sqrt{c} \sqrt{c d^2-b d e+a e^2}}, \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right], -1\right]\right) \Big/$$

$$\left(\sqrt{2} c e^4 (b+2 c x) \left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 8, 24 leaves) :

$$\int \frac{\left(a+b x+c x^2\right)^{5/4}}{d+e x} \, dx$$

Problem 2527: Unable to integrate problem.

$$\int \frac{\left(a+b x+c x^2\right)^{5/4}}{(d+e x)^2} \, dx$$

Optimal (type 4, 975 leaves, 20 steps) :

$$-\frac{5\left(3 c d-2 b e-c e x\right)\left(a+b x+c x^2\right)^{1/4}}{3 e^3}-\frac{\left(a+b x+c x^2\right)^{5/4}}{e\left(d+e x\right)}+$$

$$\left(5\left(-b^2+4 a c\right)^{3/4}\left(2 c d-b e\right)\left(c d^2-b d e+a e^2\right)^{1/4}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\bigg/\left(4 c^{3/4} e^{7/2}\left(a+b x+c x^2\right)^{3/4}\right)+$$

$$\left(5\left(-b^2+4 a c\right)^{3/4}\left(2 c d-b e\right)\left(c d^2-b d e+a e^2\right)^{1/4}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\bigg/\left(4 c^{3/4} e^{7/2}\left(a+b x+c x^2\right)^{3/4}\right)+$$

$$\left(5\left(b^2-4 a c\right)^{1/4}\left(6 c^2 d^2+b^2 e^2-2 c e\left(3 b d-a e\right)\right)\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\bigg/$$

$$\left(6\sqrt{2}\, c^{1/4} e^4\left(b+2 c x\right)\right)+\left(5\left(b^2-4 a c\right)\left(2 c d-b e\right)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\; e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\bigg/$$

$$\left(4\sqrt{2}\, c e^4\left(b+2 c x\right)\left(a+b x+c x^2\right)^{3/4}\right)+$$

$$\left(5\left(b^2-4 a c\right)\left(2 c d-b e\right)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\; e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\bigg/$$

$$\left(4\sqrt{2}\, c e^4\left(b+2 c x\right)\left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 8, 24 leaves) :

$$\int \frac{\left(a+b\,x+c\,x^2\right)^{5/4}}{\left(d+e\,x\right)^2}\,dx$$

Problem 2528: Result unnecessarily involves higher level functions.

$$\int \frac{\left(d+e\,x\right)^3}{\left(a+b\,x+c\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 637 leaves, 6 steps) :

$$\frac{2 e (d+e x)^2 \left(a+b x+c x^2\right)^{3/4}}{7 c}+\frac{1}{210 c^3}$$
$$e \left(360 c^2 d^2+77 b^2 e^2-2 c e (147 b d+40 a e)+66 c e (2 c d-b e) x\right) \left(a+b x+c x^2\right)^{3/4}+$$
$$\left((2 c d-b e) \left(20 c^2 d^2+11 b^2 e^2-4 c e (5 b d+6 a e)\right) (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right)\Big/$$
$$\left(20 c^{7/2} \sqrt{b^2-4 a c} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\right)-$$
$$\left(\left(b^2-4 a c\right)^{3/4} (2 c d-b e) \left(20 c^2 d^2+11 b^2 e^2-4 c e (5 b d+6 a e)\right) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right)\Big/\left(20 \sqrt{2} c^{15/4} (b+2 c x)\right)+$$
$$\left(\left(b^2-4 a c\right)^{3/4} (2 c d-b e) \left(20 c^2 d^2+11 b^2 e^2-4 c e (5 b d+6 a e)\right) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right)\Big/\left(40 \sqrt{2} c^{15/4} (b+2 c x)\right)$$

Result (type 5, 232 leaves) :

$$\left(4\,c\,e\,(a+x\,(b+c\,x))\,\left(77\,b^2\,e^2-2\,c\,e\,(147\,b\,d+40\,a\,e+33\,b\,e\,x)+12\,c^2\,\left(35\,d^2+21\,d\,e\,x+5\,e^2\,x^2\right)\right)+\right.$$
$$7\times 2^{3/4}\,(2\,c\,d-b\,e)\,\left(20\,c^2\,d^2+11\,b^2\,e^2-4\,c\,e\,(5\,b\,d+6\,a\,e)\right)$$
$$\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(840\,c^4\,(a+x\,(b+c\,x))^{1/4}\right)$$

Problem 2529: Result unnecessarily involves higher level functions.

$$\int\frac{(d+e\,x)^2}{\left(a+b\,x+c\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 573 leaves, 6 steps):

$$\frac{7 e (2 c d - b e) (a + b x + c x^2)^{3/4}}{15 c^2} + \frac{2 e (d + e x) (a + b x + c x^2)^{3/4}}{5 c} + \frac{(20 c^2 d^2 + 7 b^2 e^2 - 4 c e (5 b d + 2 a e)) (b + 2 c x) (a + b x + c x^2)^{1/4}}{10 c^{5/2} \sqrt{b^2 - 4 a c} \left(1 + \frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)} -$$

$$\left((b^2 - 4 a c)^{3/4} (20 c^2 d^2 + 7 b^2 e^2 - 4 c e (5 b d + 2 a e)) \sqrt{\frac{(b + 2 c x)^2}{(b^2 - 4 a c) \left(1 + \frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1 + \frac{2 \sqrt{c} \sqrt{a + b x + c x^2}}{\sqrt{b^2 - 4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} (a + b x + c x^2)^{1/4}}{(b^2 - 4 a c)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(10 \sqrt{2} c^{11/4} (b + 2 c x)\right) + \left((b^2 - 4 a c)^{3/4} (20 c^2 d^2 + 7 b^2 e^2 - 4 c e (5 b d + 2 a e))\right.$$

$$\sqrt{\frac{(b + 2 c x)^2}{(b^2 - 4 a c) \left(1 + \frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}} \left(1 + \frac{2 \sqrt{c} \sqrt{a + b x + c x^2}}{\sqrt{b^2 - 4 a c}}\right)$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} c^{1/4} (a + b x + c x^2)^{1/4}}{(b^2 - 4 a c)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(20 \sqrt{2} c^{11/4} (b + 2 c x)\right)$$

Result (type 5, 185 leaves) :

$$\left(4 c e (20 c d - 7 b e + 6 c e x) (a + x (b + c x)) +\right.$$

$$2^{3/4} (20 c^2 d^2 + 7 b^2 e^2 - 4 c e (5 b d + 2 a e)) \left(b - \sqrt{b^2 - 4 a c} + 2 c x\right) \left(\frac{b + \sqrt{b^2 - 4 a c} + 2 c x}{\sqrt{b^2 - 4 a c}}\right)^{1/4}$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{-b + \sqrt{b^2 - 4 a c} - 2 c x}{2 \sqrt{b^2 - 4 a c}}\right]\right) \Big/ \left(60 c^3 (a + x (b + c x))^{1/4}\right)$$

Problem 2530: Result unnecessarily involves higher level functions.

$$\int \frac{d+e\,x}{\left(a+b\,x+c\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 469 leaves, 5 steps):

$$\frac{2\,e\,\left(a+b\,x+c\,x^2\right)^{3/4}}{3\,c}+\frac{\left(2\,c\,d-b\,e\right)\,\left(b+2\,c\,x\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{c^{3/2}\,\sqrt{b^2-4\,a\,c}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-$$

$$\left(\left(b^2-4\,a\,c\right)^{3/4}\,\left(2\,c\,d-b\,e\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,c^{7/4}\,\left(b+2\,c\,x\right)\right)+$$

$$\left(\left(b^2-4\,a\,c\right)^{3/4}\,\left(2\,c\,d-b\,e\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/\left(2\,\sqrt{2}\,c^{7/4}\,\left(b+2\,c\,x\right)\right)$$

Result (type 5, 152 leaves):

$$\left(8\,e\,\left(a+x\,\left(b+c\,x\right)\right)-\frac{1}{c}2\times 2^{3/4}\,\left(-2\,c\,d+b\,e\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(12\,c\,\left(a+x\,\left(b+c\,x\right)\right)^{1/4}\right)$$

Problem 2531: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(a+b\,x+c\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 418 leaves, 4 steps):

$$\frac{2\,(b+2\,c\,x)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\sqrt{c}\,\sqrt{b^2-4\,a\,c}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-\frac{1}{c^{3/4}\,(b+2\,c\,x)}$$

$$\sqrt{2}\,\left(b^2-4\,a\,c\right)^{3/4}\,\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}$$

$$\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]+$$

$$\left(\left(b^2-4\,a\,c\right)^{3/4}\,\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,c^{3/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 126 leaves):

$$\left(2^{3/4}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}\right.$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(3\,c\,\left(a+x\,(b+c\,x)\right)^{1/4}\right)$$

Problem 2532: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+e\,x)\,\left(a+b\,x+c\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 733 leaves, 14 steps):

$$\frac{\left(-b^2+4ac\right)^{1/4}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\text{ArcTan}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]}{c^{1/4}\sqrt{e}\left(cd^2-bde+ae^2\right)^{1/4}\left(a+bx+cx^2\right)^{1/4}}-$$

$$\left(\left(-b^2+4ac\right)^{1/4}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\text{ArcTanh}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(c^{1/4}\sqrt{e}\left(cd^2-bde+ae^2\right)^{1/4}\left(a+bx+cx^2\right)^{1/4}\right)-$$

$$\left(\sqrt{-b^2+4ac}\,(2cd-be)\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4ac}\,e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{c}\,e\sqrt{cd^2-bde+ae^2}\,(b+2cx)\left(a+bx+cx^2\right)^{1/4}\right)+$$

$$\left(\sqrt{-b^2+4ac}\,(2cd-be)\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4ac}\,e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{c}\,e\sqrt{cd^2-bde+ae^2}\,(b+2cx)\left(a+bx+cx^2\right)^{1/4}\right)$$

Result (type 6, 178 leaves):

$$-\left(\left(\sqrt{2}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{1/4}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{1/4}\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},\frac{1}{4},\frac{3}{2},\right.\right.\right.$$

$$\left.\left.\left.\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2c\,(d+ex)},\frac{2cd-be+\sqrt{b^2-4ac}\,e}{2cd+2cex}\right]\right)\Big/\left(e\left(a+x\,(b+cx)\right)^{1/4}\right)\right)$$

Problem 2533: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+ex)^2\left(a+bx+cx^2\right)^{1/4}}\,dx$$

Optimal (type 4, 1280 leaves, 20 steps):

$$-\frac{e\left(a+bx+cx^2\right)^{3/4}}{\left(cd^2-bde+ae^2\right)(d+ex)}+$$

$$\frac{\sqrt{c}\,(b+2cx)\,(a+bx+cx^2)^{1/4}}{\sqrt{b^2-4ac}\,(cd^2-bde+ae^2)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)}+\left((-b^2+4ac)^{1/4}\,(2cd-be)\right.$$

$$\left.\left(-\frac{c\,(a+bx+cx^2)}{b^2-4ac}\right)^{1/4}\text{ArcTan}\left[\frac{(-b^2+4ac)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\,(cd^2-bde+ae^2)^{1/4}}\right]\right)\Big/$$

$$\left(4c^{1/4}\sqrt{e}\,(cd^2-bde+ae^2)^{5/4}\,(a+bx+cx^2)^{1/4}\right)-\left((-b^2+4ac)^{1/4}\,(2cd-be)\right.$$

$$\left.\left(-\frac{c\,(a+bx+cx^2)}{b^2-4ac}\right)^{1/4}\text{ArcTanh}\left[\frac{(-b^2+4ac)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\,(cd^2-bde+ae^2)^{1/4}}\right]\right)\Big/$$

$$\left(4c^{1/4}\sqrt{e}\,(cd^2-bde+ae^2)^{5/4}\,(a+bx+cx^2)^{1/4}\right)-$$

$$\left(c^{1/4}\,(b^2-4ac)^{3/4}\sqrt{\frac{(b+2cx)^2}{(b^2-4ac)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+bx+cx^2)^{1/4}}{(b^2-4ac)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,(cd^2-bde+ae^2)\,(b+2cx)\right)+$$

$$\left(c^{1/4}\,(b^2-4ac)^{3/4}\sqrt{\frac{(b+2cx)^2}{(b^2-4ac)\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+bx+cx^2)^{1/4}}{(b^2-4ac)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2\sqrt{2}\,(cd^2-bde+ae^2)\,(b+2cx)\right)-$$

$$\left(\sqrt{-b^2+4ac}\,(2cd-be)^2\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\,(a+bx+cx^2)}{b^2-4ac}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\sqrt{c}\,e\left(c d^2-b d e+a e^2\right)^{3/2}(b+2 c x)\left(a+b x+c x^2\right)^{1/4}\right)+$$

$$\left(\sqrt{-b^2+4 a c}\,(2 c d-b e)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\,e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\sqrt{c}\,e\left(c d^2-b d e+a e^2\right)^{3/2}(b+2 c x)\left(a+b x+c x^2\right)^{1/4}\right)$$

Result (type 6, 187 leaves):

$$-\left(\left(\sqrt{2}\left(\frac{e\left(b-\sqrt{b^2-4 a c}+2 c x\right)}{c(d+e x)}\right)^{1/4}\left(\frac{e\left(b+\sqrt{b^2-4 a c}+2 c x\right)}{c(d+e x)}\right)^{1/4}\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},\frac{1}{4},\frac{5}{2},\right.\right.\right.$$

$$\left.\left.\left.\frac{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}{2 c(d+e x)},\frac{2 c d-b e+\sqrt{b^2-4 a c}\,e}{2 c d+2 c e x}\right]\right)\Big/\left(3 e(d+e x)(a+x(b+c x))^{1/4}\right)\right)$$

Problem 2534: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+e x)^3\left(a+b x+c x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 1465 leaves, 21 steps):

$$-\frac{e\left(a+b x+c x^2\right)^{3/4}}{2\left(c d^2-b d e+a e^2\right)(d+e x)^2}-\frac{5 e(2 c d-b e)\left(a+b x+c x^2\right)^{3/4}}{8\left(c d^2-b d e+a e^2\right)^2(d+e x)}+$$

$$\frac{5\sqrt{c}\,(2 c d-b e)(b+2 c x)\left(a+b x+c x^2\right)^{1/4}}{8\sqrt{b^2-4 a c}\left(c d^2-b d e+a e^2\right)^2\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)}+$$

$$\left(\left(-b^2+4 a c\right)^{1/4}\left(12 c^2 d^2+5 b^2 e^2-4 c e(3 b d+2 a e)\right)\right.$$

$$\left.\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\,c^{1/4}\sqrt{e}\left(c d^2-b d e+a e^2\right)^{9/4}\left(a+b x+c x^2\right)^{1/4}\right)-$$

$$\left(\left(-b^2+4 a c\right)^{1/4}\left(12 c^2 d^2+5 b^2 e^2-4 c e(3 b d+2 a e)\right)\right.$$

$$\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4} \text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4} \sqrt{e} \left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4} \left(c d^2-b d e+a e^2\right)^{1/4}}\right]\Bigg/$$

$$\left(32 c^{1/4} \sqrt{e} \left(c d^2-b d e+a e^2\right)^{9/4} \left(a+b x+c x^2\right)^{1/4}\right)-$$

$$\left(5 c^{1/4} \left(b^2-4 a c\right)^{3/4} (2 c d-b e) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right)\Bigg/$$

$$\left(8 \sqrt{2} \left(c d^2-b d e+a e^2\right)^2 (b+2 c x)\right)+$$

$$\left(5 c^{1/4} \left(b^2-4 a c\right)^{3/4} (2 c d-b e) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right)\Bigg/$$

$$\left(16 \sqrt{2} \left(c d^2-b d e+a e^2\right)^2 (b+2 c x)\right)-\left(\sqrt{-b^2+4 a c}\, (2 c d-b e)\right.$$

$$\left(12 c^2 d^2+5 b^2 e^2-4 c e (3 b d+2 a e)\right) \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\; e}{2 \sqrt{c} \sqrt{c d^2-b d e+a e^2}}, \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right], -1\right]\right)\Bigg/$$

$$\left(32 \sqrt{2} \sqrt{c}\; e \left(c d^2-b d e+a e^2\right)^{5/2} (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right)+$$

$$\left(\sqrt{-b^2+4 a c}\, (2 c d-b e) \left(12 c^2 d^2+5 b^2 e^2-4 c e (3 b d+2 a e)\right)\right.$$

$$\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\,(a+bx+cx^2)}{b^2-4ac}\right)^{1/4}$$
$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\;\sqrt{c\,d^2-b\,d\,e+a\,e^2}},\;\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],\;-1\right]\right)\bigg/$$
$$\left(32\sqrt{2}\;\sqrt{c}\;e\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^{5/2}(b+2cx)\,(a+bx+cx^2)^{1/4}\right)$$

Result (type 6, 187 leaves):

$$-\left(\left(\sqrt{2}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{1/4}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{1/4}\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},\frac{1}{4},\frac{7}{2},\right.\right.\right.$$
$$\left.\left.\left.\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2c\,(d+ex)},\;\frac{2cd-be+\sqrt{b^2-4ac}\;e}{2cd+2cex}\right]\right)\bigg/\left(5e\,(d+ex)^2\left(a+x\,(b+cx)\right)^{1/4}\right)\right)$$

Problem 2535: Result unnecessarily involves higher level functions.

$$\int\frac{(d+ex)^3}{(a+bx+cx^2)^{3/4}}\,dx$$

Optimal (type 4, 307 leaves, 4 steps):

$$\frac{2e\,(d+ex)^2(a+bx+cx^2)^{1/4}}{5c}+\frac{1}{10c^3}$$
$$e\left(56c^2d^2+15b^2e^2-2ce\,(25bd+8ae)+6ce\,(2cd-be)\,x\right)(a+bx+cx^2)^{1/4}+$$
$$\left((b^2-4ac)^{1/4}(2cd-be)\left(4c^2d^2+3b^2e^2-4ce\,(bd+2ae)\right)\right.$$
$$\sqrt{\frac{(b+2cx)^2}{(b^2-4ac)\left(1+\frac{2\sqrt{c}\;\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\left(1+\frac{2\sqrt{c}\;\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\;c^{1/4}(a+bx+cx^2)^{1/4}}{(b^2-4ac)^{1/4}}\right],\;\frac{1}{2}\right]\right)\bigg/\left(4\sqrt{2}\;c^{13/4}(b+2cx)\right)$$

Result (type 5, 230 leaves):

$$\left(4\,c\,e\,\left(a+x\,\left(b+c\,x\right)\right)\,\left(15\,b^2\,e^2-2\,c\,e\,\left(25\,b\,d+8\,a\,e+3\,b\,e\,x\right)+4\,c^2\,\left(15\,d^2+5\,d\,e\,x+e^2\,x^2\right)\right)+5\times 2^{1/4}\,\left(2\,c\,d-b\,e\right)\,\left(4\,c^2\,d^2+3\,b^2\,e^2-4\,c\,e\,\left(b\,d+2\,a\,e\right)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(40\,c^4\,\left(a+x\,\left(b+c\,x\right)\right)^{3/4}\right)$$

Problem 2536: Result unnecessarily involves higher level functions.

$$\int\frac{\left(d+e\,x\right)^2}{\left(a+b\,x+c\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 262 leaves, 4 steps):

$$\frac{5\,e\,\left(2\,c\,d-b\,e\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{3\,c^2}+\frac{2\,e\,\left(d+e\,x\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{3\,c}+\left(\left(b^2-4\,a\,c\right)^{1/4}\,\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,\left(3\,b\,d+2\,a\,e\right)\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(6\,\sqrt{2}\,c^{9/4}\,\left(b+2\,c\,x\right)\right)$$

Result (type 5, 186 leaves):

$$\left(4\,c\,e\,\left(a+x\,\left(b+c\,x\right)\right)\,\left(-5\,b\,e+2\,c\,\left(6\,d+e\,x\right)\right)+2^{1/4}\,\left(12\,c^2\,d^2+5\,b^2\,e^2-4\,c\,e\,\left(3\,b\,d+2\,a\,e\right)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(12\,c^3\,\left(a+x\,\left(b+c\,x\right)\right)^{3/4}\right)$$

Problem 2537: Result unnecessarily involves higher level functions.

$$\int \frac{d+e\,x}{\left(a+b\,x+c\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 200 leaves, 3 steps):

$$\frac{2\,e\,\left(a+b\,x+c\,x^2\right)^{1/4}}{c}+\left(\left(b^2-4\,a\,c\right)^{1/4}\,\left(2\,c\,d-b\,e\right)\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,c^{5/4}\,\left(b+2\,c\,x\right)\right)$$

Result (type 5, 152 leaves):

$$\left(8\,e\,\left(a+x\,\left(b+c\,x\right)\right)-\frac{1}{c}2\times 2^{1/4}\,\left(-2\,c\,d+b\,e\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{3/4}\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(4\,c\,\left(a+x\,\left(b+c\,x\right)\right)^{3/4}\right)$$

Problem 2538: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(a+b\,x+c\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 170 leaves, 2 steps):

$$\frac{1}{c^{1/4}\,\left(b+2\,c\,x\right)}\sqrt{2}\,\left(b^2-4\,a\,c\right)^{1/4}\,\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}$$
$$\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]$$

Result (type 5, 123 leaves):

$$\left(2^{1/4}\left(b-\sqrt{b^2-4ac}+2cx\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx}{\sqrt{b^2-4ac}}\right)^{3/4}\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{-b+\sqrt{b^2-4ac}-2cx}{2\sqrt{b^2-4ac}}\right]\right)\Big/\left(c\left(a+x\left(b+cx\right)\right)^{3/4}\right)$$

Problem 2539: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+ex)\left(a+bx+cx^2\right)^{3/4}}\,dx$$

Optimal (type 4, 709 leaves, 15 steps):

$$-\left(\left(\left(-b^2+4ac\right)^{3/4}\sqrt{e}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\text{ArcTan}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/\right.$$
$$\left.\left(c^{3/4}\left(cd^2-bde+ae^2\right)^{3/4}\left(a+bx+cx^2\right)^{3/4}\right)\right)-$$
$$\left(\left(-b^2+4ac\right)^{3/4}\sqrt{e}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\text{ArcTanh}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$
$$\left(c^{3/4}\left(cd^2-bde+ae^2\right)^{3/4}\left(a+bx+cx^2\right)^{3/4}\right)-$$
$$\left(\left(b^2-4ac\right)\left(2cd-be\right)\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\right.$$
$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$
$$\left(\sqrt{2}\,c\left(cd^2-bde+ae^2\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{3/4}\right)-$$
$$\left(\left(b^2-4ac\right)\left(2cd-be\right)\sqrt{\frac{(b+2cx)^2}{b^2-4ac}}\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\right.$$
$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4ac}\;e}{2\sqrt{c}\sqrt{cd^2-bde+ae^2}},\text{ArcSin}\left[\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}\right],-1\right]\right)\Big/$$
$$\left(\sqrt{2}\,c\left(cd^2-bde+ae^2\right)\left(b+2cx\right)\left(a+bx+cx^2\right)^{3/4}\right)$$

Result (type 6, 180 leaves):

$$-\left(\left(\left(\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\,(d+e x)}\right)^{3/4}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\,(d+e x)}\right)^{3/4}\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},\frac{3}{4},\frac{5}{2},\right.\right.\right.\right.$$
$$\left.\left.\left.\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2c\,(d+e x)},\frac{2cd-be+\sqrt{b^2-4ac}\;e}{2cd+2cex}\right]\right)\Big/\left(3\sqrt{2}\;e\,\left(a+x\,(b+c x)\right)^{3/4}\right)\right)$$

Problem 2540: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+e x)^2\,\left(a+b x+c x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 970 leaves, 19 steps) :

$$-\frac{e\left(a+b x+c x^2\right)^{1/4}}{\left(c d^2-b d e+a e^2\right)(d+e x)}-\left(3\left(-b^2+4 a c\right)^{3/4}\sqrt{e}\,(2 c d-b e)\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(4 c^{3/4}\left(c d^2-b d e+a e^2\right)^{7/4}\left(a+b x+c x^2\right)^{3/4}\right)-\left(3\left(-b^2+4 a c\right)^{3/4}\sqrt{e}\,(2 c d-b e)\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(4 c^{3/4}\left(c d^2-b d e+a e^2\right)^{7/4}\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(c^{3/4}\left(b^2-4 a c\right)^{1/4}\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\left(c d^2-b d e+a e^2\right)(b+2 c x)\right)-$$

$$\left(3\left(b^2-4 a c\right)(2 c d-b e)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\;e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\,c\left(c d^2-b d e+a e^2\right)^2(b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(3\left(b^2-4 a c\right)(2 c d-b e)^2\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\;e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(4\sqrt{2}\,c\left(c d^2-b d e+a e^2\right)^2(b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 6, 187 leaves) :

$$-\left(\left(\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{3/4}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{c\,(d+ex)}\right)^{3/4}\right.\right.$$
$$\left.\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},\frac{3}{4},\frac{7}{2},\frac{2cd-\left(b+\sqrt{b^2-4ac}\right)e}{2c\,(d+ex)},\frac{2cd-be+\sqrt{b^2-4ac}\,e}{2cd+2cex}\right]\right)\Big/$$
$$\left.\left(5\sqrt{2}\,e\,(d+ex)\,\left(a+x\,(b+cx)\right)^{3/4}\right)\right)$$

Problem 2541: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(d+ex)^3\,\left(a+bx+cx^2\right)^{3/4}}\,dx$$

Optimal (type 4, 1134 leaves, 20 steps):

$$-\frac{e\left(a+bx+cx^2\right)^{1/4}}{2\left(cd^2-bde+ae^2\right)(d+ex)^2}-\frac{7e\,(2cd-be)\left(a+bx+cx^2\right)^{1/4}}{8\left(cd^2-bde+ae^2\right)^2(d+ex)}-$$
$$\left(3\left(-b^2+4ac\right)^{3/4}\sqrt{e}\,\left(20c^2d^2+7b^2e^2-4ce\,(5bd+2ae)\right)\right.$$
$$\left.\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\text{ArcTan}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\,\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$
$$\left(32c^{3/4}\left(cd^2-bde+ae^2\right)^{11/4}\left(a+bx+cx^2\right)^{3/4}\right)-$$
$$\left(3\left(-b^2+4ac\right)^{3/4}\sqrt{e}\,\left(20c^2d^2+7b^2e^2-4ce\,(5bd+2ae)\right)\right.$$
$$\left.\left(-\frac{c\left(a+bx+cx^2\right)}{b^2-4ac}\right)^{3/4}\text{ArcTanh}\left[\frac{\left(-b^2+4ac\right)^{1/4}\sqrt{e}\,\left(1-\frac{(b+2cx)^2}{b^2-4ac}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(cd^2-bde+ae^2\right)^{1/4}}\right]\right)\Big/$$
$$\left(32c^{3/4}\left(cd^2-bde+ae^2\right)^{11/4}\left(a+bx+cx^2\right)^{3/4}\right)-$$
$$\left(7c^{3/4}\left(b^2-4ac\right)^{1/4}(2cd-be)\sqrt{\frac{(b+2cx)^2}{\left(b^2-4ac\right)\left(1+\frac{2\sqrt{c}\,\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)^2}}\right.$$
$$\left.\left(1+\frac{2\sqrt{c}\,\sqrt{a+bx+cx^2}}{\sqrt{b^2-4ac}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+bx+cx^2\right)^{1/4}}{\left(b^2-4ac\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(8\sqrt{2}\left(c d^2-b d e+a e^2\right)^2 (b+2 c x)\right)-\left(3\left(b^2-4 a c\right)(2 c d-b e)\right.$$

$$\left(20 c^2 d^2+7 b^2 e^2-4 c e (5 b d+2 a e)\right)\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\ e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(32\sqrt{2}\ c\left(c d^2-b d e+a e^2\right)^3 (b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)-$$

$$\left(3\left(b^2-4 a c\right)(2 c d-b e)\left(20 c^2 d^2+7 b^2 e^2-4 c e (5 b d+2 a e)\right)\right.$$

$$\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{3/4}$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\ e}{2\sqrt{c}\sqrt{c d^2-b d e+a e^2}},\text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],-1\right]\right)\Big/$$

$$\left(32\sqrt{2}\ c\left(c d^2-b d e+a e^2\right)^3 (b+2 c x)\left(a+b x+c x^2\right)^{3/4}\right)$$

Result (type 6, 187 leaves):

$$-\left(\left(\left(\frac{e\left(b-\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{3/4}\left(\frac{e\left(b+\sqrt{b^2-4 a c}+2 c x\right)}{c (d+e x)}\right)^{3/4}\right.\right.$$

$$\left.\text{AppellF1}\left[\frac{7}{2},\frac{3}{4},\frac{3}{4},\frac{9}{2},\frac{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}{2 c (d+e x)},\frac{2 c d-b e+\sqrt{b^2-4 a c}\ e}{2 c d+2 c e x}\right]\right)\Big/$$

$$\left.\left(7\sqrt{2}\ e (d+e x)^2 (a+x (b+c x))^{3/4}\right)\right)$$

Problem 2542: Result unnecessarily involves higher level functions.

$$\int\frac{(d+e x)^3}{\left(a+b x+c x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 662 leaves, 6 steps):

$$-\frac{4\,(d+e\,x)^2\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{\left(b^2-4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}+\frac{1}{3\,c^2\,\left(b^2-4\,a\,c\right)}$$

$$2\,e\,\left(24\,c^2\,d^2+7\,b^2\,e^2-2\,c\,e\,(9\,b\,d+8\,a\,e)+6\,c\,e\,(2\,c\,d-b\,e)\,x\right)\,\left(a+b\,x+c\,x^2\right)^{3/4}+$$

$$\left((2\,c\,d-b\,e)\,\left(4\,c^2\,d^2+7\,b^2\,e^2-4\,c\,e\,(b\,d+6\,a\,e)\right)\,(b+2\,c\,x)\,\left(a+b\,x+c\,x^2\right)^{1/4}\right)\Big/$$

$$\left(c^{5/2}\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right)-$$

$$\left((2\,c\,d-b\,e)\,\left(4\,c^2\,d^2+7\,b^2\,e^2-4\,c\,e\,(b\,d+6\,a\,e)\right)\,\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$

$$\left(\sqrt{2}\,c^{11/4}\,\left(b^2-4\,a\,c\right)^{1/4}\,(b+2\,c\,x)\right)+\left((2\,c\,d-b\,e)\,\left(4\,c^2\,d^2+7\,b^2\,e^2-4\,c\,e\,(b\,d+6\,a\,e)\right)\right.$$

$$\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/\left(2\,\sqrt{2}\,c^{11/4}\,\left(b^2-4\,a\,c\right)^{1/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 284 leaves) :

$$-\frac{1}{6 c^3 \left(b^2-4 a c\right) \left(a+x (b+c x)\right)^{1/4}}\left(-4 c \left(b^2-4 a c\right) e^3 \left(a+x (b+c x)\right)+24 c \left(-b^3 e^3 x+b^2 e^2 \left(-a e+3 c d x\right)+2 c \left(a^2 e^3+c^2 d^3 x-3 a c d e (d+e x)\right)+b c \left(c d^2 (d-3 e x)+3 a e^2 (d+e x)\right)\right)+2^{3/4} \left(-2 c d+b e\right) \left(4 c^2 d^2+7 b^2 e^2-4 c e \left(b d+6 a e\right)\right) \left(b-\sqrt{b^2-4 a c}+2 c x\right) \left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4 a c}-2 c x}{2 \sqrt{b^2-4 a c}}\right]\right)$$

Problem 2543: Result unnecessarily involves higher level functions.

$$\int \frac{(d+e x)^2}{\left(a+b x+c x^2\right)^{5/4}} \, dx$$

Optimal (type 4, 594 leaves, 6 steps):

$$-\frac{4\,(d+e\,x)\,\left(b\,d-2\,a\,e+(2\,c\,d-b\,e)\,x\right)}{(b^2-4\,a\,c)\,(a+b\,x+c\,x^2)^{1/4}}+\frac{4\,e\,(2\,c\,d-b\,e)\,(a+b\,x+c\,x^2)^{3/4}}{c\,(b^2-4\,a\,c)}+\frac{2\,\left(4\,c^2\,d^2+3\,b^2\,e^2-4\,c\,e\,(b\,d+2\,a\,e)\right)\,(b+2\,c\,x)\,(a+b\,x+c\,x^2)^{1/4}}{c^{3/2}\,(b^2-4\,a\,c)^{3/2}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-$$

$$\left(\sqrt{2}\,\left(4\,c^2\,d^2+3\,b^2\,e^2-4\,c\,e\,(b\,d+2\,a\,e)\right)\sqrt{\frac{(b+2\,c\,x)^2}{(b^2-4\,a\,c)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+b\,x+c\,x^2)^{1/4}}{(b^2-4\,a\,c)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(c^{7/4}\,(b^2-4\,a\,c)^{1/4}\,(b+2\,c\,x)\right)+\left(\left(4\,c^2\,d^2+3\,b^2\,e^2-4\,c\,e\,(b\,d+2\,a\,e)\right)\right.$$

$$\sqrt{\frac{(b+2\,c\,x)^2}{(b^2-4\,a\,c)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,(a+b\,x+c\,x^2)^{1/4}}{(b^2-4\,a\,c)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,c^{7/4}\,(b^2-4\,a\,c)^{1/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 221 leaves):

$$\left(24\,\left(a\,b\,e^2+2\,c^2\,d^2\,x+b^2\,e^2\,x+b\,c\,d\,(d-2\,e\,x)-2\,a\,c\,e\,(2\,d+e\,x)\right)-\frac{1}{c}\right.$$

$$2\times 2^{3/4}\,\left(4\,c^2\,d^2+3\,b^2\,e^2-4\,c\,e\,(b\,d+2\,a\,e)\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}$$

$$\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(6\,c\,(-b^2+4\,a\,c)\,\left(a+x\,(b+c\,x)\right)^{1/4}\right)$$

Problem 2544: Result unnecessarily involves higher level functions.

$$\int \frac{d+e\,x}{\left(a+b\,x+c\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 490 leaves, 5 steps):

$$-\frac{4\left(b\,d-2\,a\,e+\left(2\,c\,d-b\,e\right)x\right)}{\left(b^2-4\,a\,c\right)\left(a+b\,x+c\,x^2\right)^{1/4}}+\frac{4\left(2\,c\,d-b\,e\right)\left(b+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^{1/4}}{\sqrt{c}\,\left(b^2-4\,a\,c\right)^{3/2}\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-$$

$$\left(2\sqrt{2}\left(2\,c\,d-b\,e\right)\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(c^{3/4}\left(b^2-4\,a\,c\right)^{1/4}\left(b+2\,c\,x\right)\right)+$$

$$\left(\sqrt{2}\left(2\,c\,d-b\,e\right)\sqrt{\frac{\left(b+2\,c\,x\right)^2}{\left(b^2-4\,a\,c\right)\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\left(1+\frac{2\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(c^{3/4}\left(b^2-4\,a\,c\right)^{1/4}\left(b+2\,c\,x\right)\right)$$

Result (type 5, 167 leaves):

$$-\left(\left(2\left(6\,c\left(-2\,a\,e+2\,c\,d\,x+b\left(d-e\,x\right)\right)+2^{3/4}\left(-2\,c\,d+b\,e\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\right.\right.\right.$$

$$\left.\left.\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\sqrt{b^2-4\,a\,c}}\right]\right)\right)\Big/$$

$$\left.\left(3\,c\left(b^2-4\,a\,c\right)\left(a+x\left(b+c\,x\right)\right)^{1/4}\right)\right)$$

Problem 2545: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(a+b\,x+c\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 451 leaves, 5 steps):

$$-\frac{4\,(b+2\,c\,x)}{\left(b^2-4\,a\,c\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}}+\frac{8\,\sqrt{c}\,(b+2\,c\,x)\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{3/2}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)}-$$

$$\left(4\,\sqrt{2}\,c^{1/4}\,\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\left(b^2-4\,a\,c\right)^{1/4}\,(b+2\,c\,x)\right)+$$

$$\left(2\,\sqrt{2}\,c^{1/4}\,\sqrt{\frac{(b+2\,c\,x)^2}{\left(b^2-4\,a\,c\right)\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)^2}}\,\left(1+\frac{2\,\sqrt{c}\,\sqrt{a+b\,x+c\,x^2}}{\sqrt{b^2-4\,a\,c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\,\left(a+b\,x+c\,x^2\right)^{1/4}}{\left(b^2-4\,a\,c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\left(b^2-4\,a\,c\right)^{1/4}\,(b+2\,c\,x)\right)$$

Result (type 5, 161 leaves):

$$\left(4\left(-3\,(b+2\,c\,x)+2^{3/4}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}+2\,c\,\sqrt{b^2-4\,a\,c}\,x}{b^2-4\,a\,c}\right)^{1/4}\right.\right.$$

$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\right)\Big/$$

$$\left(3\,\left(b^2-4\,a\,c\right)\,\left(a+x\,(b+c\,x)\right)^{1/4}\right)$$

Problem 2546: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(d+e\,x)\,\left(a+b\,x+c\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 1299 leaves, 20 steps):

$$-\frac{4\left(b c d-b^2 e+2 a c e+c(2 c d-b e) x\right)}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)\left(a+b x+c x^2\right)^{1/4}}+\frac{4\sqrt{c}\,(2 c d-b e)(b+2 c x)\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{3/2}\left(c d^2-b d e+a e^2\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)}+$$

$$\left(\left(-b^2+4 a c\right)^{1/4} e^{3/2}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(c^{1/4}\left(c d^2-b d e+a e^2\right)^{5/4}\left(a+b x+c x^2\right)^{1/4}\right)-$$

$$\left(\left(-b^2+4 a c\right)^{1/4} e^{3/2}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4}\sqrt{e}\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\,c^{1/4}\left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Big/$$

$$\left(c^{1/4}\left(c d^2-b d e+a e^2\right)^{5/4}\left(a+b x+c x^2\right)^{1/4}\right)-$$

$$\left(2\sqrt{2}\,c^{1/4}(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\text{EllipticE}\left[\right.\right.$$

$$\left.\left.2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(\left(b^2-4 a c\right)^{1/4}\left(c d^2-b d e+a e^2\right)(b+2 c x)\right)+$$

$$\left(\sqrt{2}\,c^{1/4}(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right)\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\left(1+\frac{2\sqrt{c}\sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,c^{1/4}\left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(\left(b^2-4 a c\right)^{1/4}\left(c d^2-b d e+a e^2\right)(b+2 c x)\right)-$$

$$\left(\sqrt{-b^2+4 a c}\;e\,(2 c d-b e)\sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}}\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\right.$$

$$\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\; e}{2 \sqrt{c}\; \sqrt{c d^2-b d e+a e^2}},\ \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],\ -1\right]\Bigg/$$
$$\left(\sqrt{2}\; \sqrt{c}\; \left(c d^2-b d e+a e^2\right)^{3/2} (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right)+$$
$$\left(\sqrt{-b^2+4 a c}\; e\, (2 c d-b e) \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\right.$$
$$\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\; e}{2 \sqrt{c}\; \sqrt{c d^2-b d e+a e^2}},\ \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right],\ -1\right]\Bigg)\Bigg/$$
$$\left(\sqrt{2}\; \sqrt{c}\; \left(c d^2-b d e+a e^2\right)^{3/2} (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right)$$

Result (type 6, 180 leaves) :

$$-\left(\left(\left(\left(\frac{e \left(b-\sqrt{b^2-4 a c}+2 c x\right)}{c\, (d+e x)}\right)^{5/4} \left(\frac{e \left(b+\sqrt{b^2-4 a c}+2 c x\right)}{c\, (d+e x)}\right)^{5/4} \text{AppellF1}\left[\frac{5}{2},\frac{5}{4},\frac{5}{4},\frac{7}{2},\right.\right.\right.\right.$$
$$\left.\left.\frac{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}{2 c\, (d+e x)},\ \frac{2 c d-b e+\sqrt{b^2-4 a c}\; e}{2 c d+2 c e x}\right]\right)\Bigg/\left(10 \sqrt{2}\; e\, \left(a+x\, (b+c x)\right)^{5/4}\right)\Bigg)$$

Problem 2547: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(d+e x)^2 \left(a+b x+c x^2\right)^{5/4}}\, dx$$

Optimal (type 4, 1485 leaves, 21 steps) :

$$-\frac{4 \left(b c d-b^2 e+2 a c e+c\, (2 c d-b e)\, x\right)}{\left(b^2-4 a c\right) \left(c d^2-b d e+a e^2\right) (d+e x) \left(a+b x+c x^2\right)^{1/4}}-$$
$$\frac{e \left(8 c^2 d^2+5 b^2 e^2-4 c e\, (2 b d+3 a e)\right) \left(a+b x+c x^2\right)^{3/4}}{\left(b^2-4 a c\right) \left(c d^2-b d e+a e^2\right)^2 (d+e x)}+$$
$$\left(\sqrt{c}\; \left(8 c^2 d^2+5 b^2 e^2-4 c e\, (2 b d+3 a e)\right) (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right)\Bigg/$$
$$\left(\left(b^2-4 a c\right)^{3/2} \left(c d^2-b d e+a e^2\right)^2 \left(1+\frac{2 \sqrt{c}\; \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)\right)+\left(5 \left(-b^2+4 a c\right)^{1/4} e^{3/2}\right.$$
$$\left.(2 c d-b e) \left(-\frac{c \left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4} \text{ArcTan}\left[\frac{\left(-b^2+4 a c\right)^{1/4} \sqrt{e} \left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\; c^{1/4} \left(c d^2-b d e+a e^2\right)^{1/4}}\right]\right)\Bigg/$$
$$\left(4 c^{1/4} \left(c d^2-b d e+a e^2\right)^{9/4} \left(a+b x+c x^2\right)^{1/4}\right)-\left(5 \left(-b^2+4 a c\right)^{1/4} e^{3/2} (2 c d-b e)\right.$$

$$\left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4} \text{ArcTanh}\left[\frac{\left(-b^2+4 a c\right)^{1/4} \sqrt{e} \left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}}{\sqrt{2}\, c^{1/4} \left(c d^2-b d e+a e^2\right)^{1/4}}\right]\Bigg) \Big/$$

$$\left(4 c^{1/4} \left(c d^2-b d e+a e^2\right)^{9/4} \left(a+b x+c x^2\right)^{1/4}\right) -$$

$$\left(c^{1/4} \left(8 c^2 d^2+5 b^2 e^2-4 c e (2 b d+3 a e)\right) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(\sqrt{2} \left(b^2-4 a c\right)^{1/4} \left(c d^2-b d e+a e^2\right)^2 (b+2 c x)\right) +$$

$$\left(c^{1/4} \left(8 c^2 d^2+5 b^2 e^2-4 c e (2 b d+3 a e)\right) \sqrt{\frac{(b+2 c x)^2}{\left(b^2-4 a c\right) \left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right)^2}}\right.$$

$$\left.\left(1+\frac{2 \sqrt{c} \sqrt{a+b x+c x^2}}{\sqrt{b^2-4 a c}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2}\, c^{1/4} \left(a+b x+c x^2\right)^{1/4}}{\left(b^2-4 a c\right)^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(2 \sqrt{2} \left(b^2-4 a c\right)^{1/4} \left(c d^2-b d e+a e^2\right)^2 (b+2 c x)\right) -$$

$$\left(5 \sqrt{-b^2+4 a c}\; e\, (2 c d-b e)^2 \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[-\frac{\sqrt{-b^2+4 a c}\; e}{2 \sqrt{c} \sqrt{c d^2-b d e+a e^2}}, \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right], -1\right]\right) \Big/$$

$$\left(4 \sqrt{2} \sqrt{c} \left(c d^2-b d e+a e^2\right)^{5/2} (b+2 c x) \left(a+b x+c x^2\right)^{1/4}\right) +$$

$$\left(5 \sqrt{-b^2+4 a c}\; e\, (2 c d-b e)^2 \sqrt{\frac{(b+2 c x)^2}{b^2-4 a c}} \left(-\frac{c\left(a+b x+c x^2\right)}{b^2-4 a c}\right)^{1/4}\right.$$

$$\left.\text{EllipticPi}\left[\frac{\sqrt{-b^2+4 a c}\; e}{2 \sqrt{c} \sqrt{c d^2-b d e+a e^2}}, \text{ArcSin}\left[\left(1-\frac{(b+2 c x)^2}{b^2-4 a c}\right)^{1/4}\right], -1\right]\right) \Big/$$

$$\left(4\sqrt{2}\,\sqrt{c}\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^{5/2}\,\left(b+2\,c\,x\right)\,\left(a+b\,x+c\,x^2\right)^{1/4}\right)$$

Result (type 6, 187 leaves):

$$-\left(\left(\left(\left(\frac{e\,\left(b-\sqrt{b^2-4\,a\,c}\,+2\,c\,x\right)}{c\,\left(d+e\,x\right)}\right)^{5/4}\,\left(\frac{e\,\left(b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x\right)}{c\,\left(d+e\,x\right)}\right)^{5/4}\right.\right.\right.$$
$$\left.\text{AppellF1}\left[\frac{7}{2},\frac{5}{4},\frac{5}{4},\frac{9}{2},\frac{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}{2\,c\,\left(d+e\,x\right)},\frac{2\,c\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}{2\,c\,d+2\,c\,e\,x}\right]\right)\Bigg/$$
$$\left.\left(14\,\sqrt{2}\,e\,\left(d+e\,x\right)\,\left(a+x\,\left(b+c\,x\right)\right)^{5/4}\right)\right)$$

Problem 2549: Result more than twice size of optimal antiderivative.

$$\int\left(d+e\,x\right)^m\,\left(a+b\,x+c\,x^2\right)^4\,dx$$

Optimal (type 3, 485 leaves, 2 steps):

$$\frac{\left(c\,d^2-b\,d\,e+a\,e^2\right)^4\,\left(d+e\,x\right)^{1+m}}{e^9\,\left(1+m\right)}-\frac{4\,\left(2\,c\,d-b\,e\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,\left(d+e\,x\right)^{2+m}}{e^9\,\left(2+m\right)}+\frac{1}{e^9\,\left(3+m\right)}$$
$$2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,\left(14\,c^2\,d^2+3\,b^2\,e^2-2\,c\,e\,\left(7\,b\,d-a\,e\right)\right)\,\left(d+e\,x\right)^{3+m}-\frac{1}{e^9\,\left(4+m\right)}$$
$$4\,\left(2\,c\,d-b\,e\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,\left(7\,c^2\,d^2+b^2\,e^2-c\,e\,\left(7\,b\,d-3\,a\,e\right)\right)\,\left(d+e\,x\right)^{4+m}+$$
$$\frac{1}{e^9\,\left(5+m\right)}\left(70\,c^4\,d^4+b^4\,e^4-4\,b^2\,c\,e^3\,\left(5\,b\,d-3\,a\,e\right)-\right.$$
$$\left.20\,c^3\,d^2\,e\,\left(7\,b\,d-3\,a\,e\right)+6\,c^2\,e^2\,\left(15\,b^2\,d^2-10\,a\,b\,d\,e+a^2\,e^2\right)\right)\,\left(d+e\,x\right)^{5+m}-$$
$$\frac{4\,c\,\left(2\,c\,d-b\,e\right)\,\left(7\,c^2\,d^2+b^2\,e^2-c\,e\,\left(7\,b\,d-3\,a\,e\right)\right)\,\left(d+e\,x\right)^{6+m}}{e^9\,\left(6+m\right)}+$$
$$\frac{2\,c^2\,\left(14\,c^2\,d^2+3\,b^2\,e^2-2\,c\,e\,\left(7\,b\,d-a\,e\right)\right)\,\left(d+e\,x\right)^{7+m}}{e^9\,\left(7+m\right)}-\frac{4\,c^3\,\left(2\,c\,d-b\,e\right)\,\left(d+e\,x\right)^{8+m}}{e^9\,\left(8+m\right)}+\frac{c^4\,\left(d+e\,x\right)^{9+m}}{e^9\,\left(9+m\right)}$$

Result (type 3, 1708 leaves):

$$\frac{1}{e^9 (1+m) (2+m) (3+m) (4+m) (5+m) (6+m) (7+m) (8+m) (9+m)} (d+e x)^{1+m} \Big(c^4 \big(40320 d^8 - 40320 d^7 e (1+m) x + 20160 d^6 e^2 (2+3 m+m^2) x^2 - 6720 d^5 e^3 (6+11 m+6 m^2+m^3) x^3 + 1680 d^4 e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4 - 336 d^3 e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5 + 56 d^2 e^6 (720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6) x^6 - 8 d e^7 (5040+13068 m+13132 m^2+6769 m^3+1960 m^4+322 m^5+28 m^6+m^7) x^7 + e^8 (40320+109584 m+118124 m^2+67284 m^3+22449 m^4+4536 m^5+546 m^6+36 m^7+m^8) x^8\big) + e^4 (3024+1650 m+335 m^2+30 m^3+m^4) \big(a^4 e^4 (120+154 m+71 m^2+14 m^3+m^4) + 4 a^3 b e^3 (60+47 m+12 m^2+m^3) (-d+e (1+m) x) + 6 a^2 b^2 e^2 (20+9 m+m^2) (2 d^2-2 d e (1+m) x+e^2 (2+3 m+m^2) x^2) + 4 a b^3 e (5+m) (-6 d^3+6 d^2 e (1+m) x-3 d e^2 (2+3 m+m^2) x^2+e^3 (6+11 m+6 m^2+m^3) x^3) + b^4 (24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 (2+3 m+m^2) x^2-4 d e^3 (6+11 m+6 m^2+m^3) x^3 + e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4)\big) + 4 c e^3 (504+191 m+24 m^2+m^3) \big(a^3 e^3 (120+74 m+15 m^2+m^3) (2 d^2-2 d e (1+m) x+e^2 (2+3 m+m^2) x^2) + 3 a^2 b e^2 (30+11 m+m^2) (-6 d^3+6 d^2 e (1+m) x-3 d e^2 (2+3 m+m^2) x^2+e^3 (6+11 m+6 m^2+m^3) x^3) + 3 a b^2 e (6+m) (24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 (2+3 m+m^2) x^2 - 4 d e^3 (6+11 m+6 m^2+m^3) x^3+e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4) + b^3 (-120 d^5+120 d^4 e (1+m) x-60 d^3 e^2 (2+3 m+m^2) x^2+20 d^2 e^3 (6+11 m+6 m^2+m^3) x^3 - 5 d e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4+e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5)\big) + 6 c^2 e^2 (72+17 m+m^2) \big(a^2 e^2 (42+13 m+m^2) (24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 (2+3 m+m^2) x^2 - 4 d e^3 (6+11 m+6 m^2+m^3) x^3+e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4) + 2 a b e (7+m) (-120 d^5+120 d^4 e (1+m) x-60 d^3 e^2 (2+3 m+m^2) x^2+20 d^2 e^3 (6+11 m+6 m^2+m^3) x^3 - 5 d e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4+e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5) + b^2 (720 d^6-720 d^5 e (1+m) x+360 d^4 e^2 (2+3 m+m^2) x^2-120 d^3 e^3 (6+11 m+6 m^2+m^3) x^3 + 30 d^2 e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4-6 d e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5+e^6 (720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6) x^6)\big) + 4 c^3 e (9+m) \big(a e (8+m) (720 d^6-720 d^5 e (1+m) x+360 d^4 e^2 (2+3 m+m^2) x^2 - 120 d^3 e^3 (6+11 m+6 m^2+m^3) x^3+30 d^2 e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4 - 6 d e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5 + e^6 (720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6) x^6) + b (-5040 d^7+5040 d^6 e (1+m) x-2520 d^5 e^2 (2+3 m+m^2) x^2 + 840 d^4 e^3 (6+11 m+6 m^2+m^3) x^3-210 d^3 e^4 (24+50 m+35 m^2+10 m^3+m^4) x^4 + 42 d^2 e^5 (120+274 m+225 m^2+85 m^3+15 m^4+m^5) x^5 - 7 d e^6 (720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6) x^6 + e^7 (5040+13068 m+13132 m^2+6769 m^3+1960 m^4+322 m^5+28 m^6+m^7) x^7)\big)\Big)$$

Problem 2550: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^m (a+b x+c x^2)^3 \, dx$$

Optimal (type 3, 305 leaves, 2 steps):

$$\frac{\left(c d^2-b d e+a e^2\right)^3 (d+e x)^{1+m}}{e^7 (1+m)}-\frac{3 (2 c d-b e) \left(c d^2-b d e+a e^2\right)^2 (d+e x)^{2+m}}{e^7 (2+m)}+\frac{3 \left(c d^2-b d e+a e^2\right) \left(5 c^2 d^2+b^2 e^2-c e (5 b d-a e)\right) (d+e x)^{3+m}}{e^7 (3+m)}-\frac{(2 c d-b e) \left(10 c^2 d^2+b^2 e^2-2 c e (5 b d-3 a e)\right) (d+e x)^{4+m}}{e^7 (4+m)}+\frac{3 c \left(5 c^2 d^2+b^2 e^2-c e (5 b d-a e)\right) (d+e x)^{5+m}}{e^7 (5+m)}-\frac{3 c^2 (2 c d-b e) (d+e x)^{6+m}}{e^7 (6+m)}+\frac{c^3 (d+e x)^{7+m}}{e^7 (7+m)}$$

Result (type 3, 791 leaves):

$$\frac{1}{e^7 (1+m) (2+m) (3+m) (4+m) (5+m) (6+m) (7+m)} (d+e x)^{1+m} \Big(c^3 \big(720 d^6-720 d^5 e (1+m) x+360 d^4 e^2 \left(2+3 m+m^2\right) x^2-120 d^3 e^3 \left(6+11 m+6 m^2+m^3\right) x^3+30 d^2 e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4-6 d e^5 \left(120+274 m+225 m^2+85 m^3+15 m^4+m^5\right) x^5+e^6 \left(720+1764 m+1624 m^2+735 m^3+175 m^4+21 m^5+m^6\right) x^6\big)+e^3 \left(210+107 m+18 m^2+m^3\right) \big(a^3 e^3 \left(24+26 m+9 m^2+m^3\right)+3 a^2 b e^2 \left(12+7 m+m^2\right) (-d+e (1+m) x)+3 a b^2 e (4+m) \left(2 d^2-2 d e (1+m) x+e^2 \left(2+3 m+m^2\right) x^2\right)+b^3 \left(-6 d^3+6 d^2 e (1+m) x-3 d e^2 \left(2+3 m+m^2\right) x^2+e^3 \left(6+11 m+6 m^2+m^3\right) x^3\right)\big)+3 c e^2 \left(42+13 m+m^2\right) \big(a^2 e^2 \left(20+9 m+m^2\right) \left(2 d^2-2 d e (1+m) x+e^2 \left(2+3 m+m^2\right) x^2\right)+2 a b e (5+m) \left(-6 d^3+6 d^2 e (1+m) x-3 d e^2 \left(2+3 m+m^2\right) x^2+e^3 \left(6+11 m+6 m^2+m^3\right) x^3\right)+b^2 \left(24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 \left(2+3 m+m^2\right) x^2-4 d e^3 \left(6+11 m+6 m^2+m^3\right) x^3+e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4\right)\big)+3 c^2 e (7+m) \big(a e (6+m) \left(24 d^4-24 d^3 e (1+m) x+12 d^2 e^2 \left(2+3 m+m^2\right) x^2-4 d e^3 \left(6+11 m+6 m^2+m^3\right) x^3+e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4\right)+b \left(-120 d^5+120 d^4 e (1+m) x-60 d^3 e^2 \left(2+3 m+m^2\right) x^2+20 d^2 e^3 \left(6+11 m+6 m^2+m^3\right) x^3-5 d e^4 \left(24+50 m+35 m^2+10 m^3+m^4\right) x^4+e^5 \left(120+274 m+225 m^2+85 m^3+15 m^4+m^5\right) x^5\right)\big)\Big)$$

Problem 2554: Unable to integrate problem.

$$\int \frac{(d+e x)^m}{\left(a+b x+c x^2\right)^2} \, dx$$

Optimal (type 5, 425 leaves, 5 steps):

$$-\frac{(d+e x)^{1+m}\left(b c d-b^2 e+2 a c e+c\,(2 c d-b e)\,x\right)}{\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)\left(a+b x+c x^2\right)}+$$

$$\left(c\left(4 c^2 d^2+b\left(b+\sqrt{b^2-4 a c}\right)e^2 m-2 c e\left(2 b d-2 a e\,(1-m)+\sqrt{b^2-4 a c}\,d m\right)\right)\right.$$

$$\left.(d+e x)^{1+m}\,\text{Hypergeometric2F1}\left[1,1+m,2+m,\frac{2 c\,(d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right)e}\right]\right)\Big/$$

$$\left(\left(b^2-4 a c\right)^{3/2}\left(2 c d-\left(b-\sqrt{b^2-4 a c}\right)e\right)\left(c d^2-b d e+a e^2\right)(1+m)\right)-$$

$$\left(c\left(e\,(2 c d-b e)\,m+\frac{4 c^2 d^2-4 c e\,(b d-a e\,(1-m))+b^2 e^2 m}{\sqrt{b^2-4 a c}}\right)(d+e x)^{1+m}\right.$$

$$\left.\text{Hypergeometric2F1}\left[1,1+m,2+m,\frac{2 c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Big/$$

$$\left(\left(b^2-4 a c\right)\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right)e\right)\left(c d^2-b d e+a e^2\right)(1+m)\right)$$

Result (type 8, 22 leaves) :

$$\int\frac{(d+e x)^m}{\left(a+b x+c x^2\right)^2}\,dx$$

Problem 2555: Unable to integrate problem.

$$\int(d+e x)^m\left(a+b x+c x^2\right)^{5/2}\,dx$$

Optimal (type 6, 189 leaves, 2 steps) :

$$\left((d+e x)^{1+m}\left(a+b x+c x^2\right)^{5/2}\right.$$

$$\left.\text{AppellF1}\left[1+m,-\frac{5}{2},-\frac{5}{2},2+m,\frac{2 c\,(d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right)e},\frac{2 c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right]\right)\Big/$$

$$\left(e\,(1+m)\left(1-\frac{2 c\,(d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right)e}\right)^{5/2}\left(1-\frac{2 c\,(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right)e}\right)^{5/2}\right)$$

Result (type 8, 24 leaves) :

$$\int(d+e x)^m\left(a+b x+c x^2\right)^{5/2}\,dx$$

Problem 2556: Unable to integrate problem.

$$\int (d+e x)^m \left(a+b x+c x^2\right)^{3/2} dx$$

Optimal (type 6, 189 leaves, 2 steps):

$$\left((d+e x)^{1+m} \left(a+b x+c x^2\right)^{3/2} \text{AppellF1}\left[1+m,-\frac{3}{2},-\frac{3}{2},2+m,\frac{2 c (d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e},\frac{2 c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/ \left(e (1+m) \left(1-\frac{2 c (d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e}\right)^{3/2} \left(1-\frac{2 c (d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right)^{3/2}\right)$$

Result (type 8, 24 leaves):

$$\int (d+e x)^m \left(a+b x+c x^2\right)^{3/2} dx$$

Problem 2561: Result more than twice size of optimal antiderivative.

$$\int (d x)^m \left(a+b x+c x^2\right)^p dx$$

Optimal (type 6, 137 leaves, 2 steps):

$$\frac{1}{d (1+m)} (d x)^{1+m} \left(1+\frac{2 c x}{b-\sqrt{b^2-4 a c}}\right)^{-p} \left(1+\frac{2 c x}{b+\sqrt{b^2-4 a c}}\right)^{-p} \left(a+b x+c x^2\right)^p \text{AppellF1}\left[1+m,-p,-p,2+m,-\frac{2 c x}{b-\sqrt{b^2-4 a c}},-\frac{2 c x}{b+\sqrt{b^2-4 a c}}\right]$$

Result (type 6, 439 leaves):

$$\left(2^{-1-p} c \left(b+\sqrt{b^2-4 a c}\right) (2+m) x (d x)^m \left(\frac{b-\sqrt{b^2-4 a c}}{2 c}+x\right)^{-p} \left(\frac{b-\sqrt{b^2-4 a c}+2 c x}{c}\right)^{1+p} \left(2 a+\left(b-\sqrt{b^2-4 a c}\right) x\right)^2 (a+x (b+c x))^{-1+p} \text{AppellF1}\left[1+m,-p,-p,2+m,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(\left(-b+\sqrt{b^2-4 a c}\right) (1+m) \left(b+\sqrt{b^2-4 a c}+2 c x\right) \left(-2 a (2+m) \text{AppellF1}\left[1+m,-p,-p,2+m,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]+p x \left(\left(-b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+m,1-p,-p,3+m,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]-\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+m,-p,1-p,3+m,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 2563: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d+e x)^3 \left(a+b x+c x^2\right)^p \, dx$$

Optimal (type 5, 327 leaves, 3 steps):

$$\frac{e (d+e x)^2 \left(a+b x+c x^2\right)^{1+p}}{2 c (2+p)}-\left(e \left(b e (2 c d-b e) (2+p) (3+p)-2 c (3+2 p) \left(c d^2 (5+2 p)-e (a e+b d (2+p))\right)\right)-2 c e (2 c d-b e) (1+p) (3+p) x\right) \left(a+b x+c x^2\right)^{1+p} \Big/ \left(4 c^3 (1+p) (2+p) (3+2 p)\right)-\left(2^{-1+p} (2 c d-b e) \left(b^2 e^2 (3+p)+2 c^2 d^2 (3+2 p)-2 c e (3 a e+b d (3+2 p))\right) \left(-\frac{b-\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{-1-p} \left(a+b x+c x^2\right)^{1+p} \text{Hypergeometric2F1}\left[-p,1+p,2+p,\frac{b+\sqrt{b^2-4 a c}+2 c x}{2 \sqrt{b^2-4 a c}}\right]\right) \Big/ \left(c^3 \sqrt{b^2-4 a c} (1+p) (3+2 p)\right)$$

Result (type 6, 1326 leaves):

$$\left(9 \times 2^{-2-p} c \left(b+\sqrt{b^2-4 a c}\right) d^2 e x^2 \left(\frac{b-\sqrt{b^2-4 a c}}{2 c}+x\right)^{-p} \left(\frac{b-\sqrt{b^2-4 a c}+2 c x}{c}\right)^{1+p} \left(2 a+\left(b-\sqrt{b^2-4 a c}\right) x\right)^2 (a+x (b+c x))^{-1+p}\right.$$

$$\text{AppellF1}\left[2,-p,-p,3,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)$$

$$\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\Bigg(-6\,a\,\text{AppellF1}\left[2,-p,-p,3,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$

$$p\,x\,\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3,1-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

$$\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3,-p,1-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(2\left(b+\sqrt{b^2-4\,a\,c}\right)d\,e^2\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(2\,a+\left(b-\sqrt{b^2-4\,a\,c}\right)x\right)^2$$

$$\left(a+x\,(b+c\,x)\right)^{-1+p}\text{AppellF1}\left[3,-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$

$$\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)$$

$$\Bigg(-8\,a\,\text{AppellF1}\left[3,-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$

$$p\,x\,\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[4,1-p,-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

$$\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[4,-p,1-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(5\times 2^{-3-p}\,c\left(b+\sqrt{b^2-4\,a\,c}\right)e^3\,x^4\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x\right)^{-p}\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x}{c}\right)^{1+p}$$

$$\left(2\,a+\left(b-\sqrt{b^2-4\,a\,c}\right)x\right)^2\left(a+x\,(b+c\,x)\right)^{-1+p}$$

$$\text{AppellF1}\left[4,-p,-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$

$$\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)$$

$$\Bigg(-10\,a\,\text{AppellF1}\left[4,-p,-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$

$$p\,x\,\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[5,1-p,-p,6,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

$$\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[5,-p,1-p,6,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{c\,(1+p)}2^{-1+p}\,d^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{-p}$$

$$\left(a+x\,(b+c\,x)\right)^p$$

$$\text{Hypergeometric2F1}\left[-p,\ 1+p,\ 2+p,\ \frac{-b+\sqrt{b^2-4\,a\,c}-2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]$$

Problem 2564: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d+e\,x)^2\,\left(a+b\,x+c\,x^2\right)^p\,dx$$

Optimal (type 5, 248 leaves, 3 steps):

$$\frac{e\,(2\,c\,d-b\,e)\,(2+p)\,\left(a+b\,x+c\,x^2\right)^{1+p}}{2\,c^2\,(1+p)\,(3+2\,p)}+\frac{e\,(d+e\,x)\,\left(a+b\,x+c\,x^2\right)^{1+p}}{c\,(3+2\,p)}-$$
$$\left(2^p\,\left(b^2\,e^2\,(2+p)+2\,c^2\,d^2\,(3+2\,p)-2\,c\,e\,(a\,e+b\,d\,(3+2\,p))\right)\,\left(-\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x}{\sqrt{b^2-4\,a\,c}}\right)^{-1-p}\right.$$
$$\left.\left(a+b\,x+c\,x^2\right)^{1+p}\,\text{Hypergeometric2F1}\left[-p,\ 1+p,\ 2+p,\ \frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(c^2\,\sqrt{b^2-4\,a\,c}\,(1+p)\,(3+2\,p)\right)$$

Result (type 6, 1001 leaves):

$$\left(3\times 2^{-1-p}\,c\left(b+\sqrt{b^2-4\,a\,c}\right)d\,e\,x^2\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x\right)^{-p}\right.$$
$$\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x}{c}\right)^{1+p}\left(2\,a+\left(b-\sqrt{b^2-4\,a\,c}\right)x\right)^2\left(a+x\left(b+c\,x\right)\right)^{-1+p}$$
$$\left.\text{AppellF1}\left[2,-p,-p,3,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\right.$$
$$\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(-6\,a\,\text{AppellF1}\left[2,-p,-p,3,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$p\,x\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3,1-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3,-p,1-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(2\left(b+\sqrt{b^2-4\,a\,c}\right)e^2\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(2\,a+\left(b-\sqrt{b^2-4\,a\,c}\right)x\right)^2\right.$$
$$\left.\left(a+x\left(b+c\,x\right)\right)^{-1+p}\text{AppellF1}\left[3,-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(3\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\right.$$
$$\left(-8\,a\,\text{AppellF1}\left[3,-p,-p,4,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$p\,x\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[4,1-p,-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[4,-p,1-p,5,-\frac{2\,c\,x}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\frac{1}{2\,c\,\left(1+p\right)}d^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(a+b\,x+c\,x^2\right)^p\left(1+\frac{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}}\right)^{-p}$$
$$\text{Hypergeometric2F1}\left[-p,1+p,2+p,-\frac{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}}\right]$$

Problem 2565: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\left(d+e\,x\right)\left(a+b\,x+c\,x^2\right)^p\,dx$$

Optimal (type 5, 160 leaves, 2 steps):

$$\frac{e\left(a+b x+c x^2\right)^{1+p}}{2 c(1+p)}-\left(2^p(2 c d-b e)\left(-\frac{b-\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{-1-p}\left(a+b x+c x^2\right)^{1+p}\right.$$
$$\left.\text{Hypergeometric2F1}\left[-p,1+p,2+p,\frac{b+\sqrt{b^2-4 a c}+2 c x}{2 \sqrt{b^2-4 a c}}\right]\right)\Big/\left(c \sqrt{b^2-4 a c}\,(1+p)\right)$$

Result (type 6, 476 leaves):

$$\frac{1}{4}\left(b-\sqrt{b^2-4 a c}+2 c x\right)\left(a+x(b+c x)\right)^p$$
$$\left(\left(3\left(b+\sqrt{b^2-4 a c}\right) e x^2\left(2 a+\left(b-\sqrt{b^2-4 a c}\right) x\right)^2 \text{AppellF1}\left[2,-p,-p,3,\right.\right.\right.$$
$$\left.\left.-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}+2 c x\right)\right.$$
$$\left(a+x(b+c x)\right)\left(-6 a\,\text{AppellF1}\left[2,-p,-p,3,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$
$$p x\left(\left(-b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[3,1-p,-p,4,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$\left.\left.\left.\left.\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[3,-p,1-p,4,-\frac{2 c x}{b+\sqrt{b^2-4 a c}},\frac{2 c x}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)\right)+$$
$$\frac{1}{c+c p}2^{1+p} d\left(\frac{b+\sqrt{b^2-4 a c}+2 c x}{\sqrt{b^2-4 a c}}\right)^{-p}\text{Hypergeometric2F1}\left[-p,1+p,2+p,\right.$$
$$\left.\left.\frac{1}{2}-\frac{b}{2\sqrt{b^2-4 a c}}-\frac{c x}{\sqrt{b^2-4 a c}}\right]\right)$$

Problem 2570: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^{3/2}\left(a+b x+c x^2\right)^p\, dx$$

Optimal (type 6, 185 leaves, 2 steps):

$$\frac{1}{5 e}2(d+e x)^{5/2}\left(a+b x+c x^2\right)^p\left(1-\frac{2 c(d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e}\right)^{-p}\left(1-\frac{2 c(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right)^{-p}$$
$$\text{AppellF1}\left[\frac{5}{2},-p,-p,\frac{7}{2},\frac{2 c(d+e x)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e},\frac{2 c(d+e x)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]$$

Result (type 6, 590 leaves):

$$-\left(\left(7\left(2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)\right)\left(2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)\right)\right.\right.$$

$$\left(b-\sqrt{\frac{b^2-4 a c}{e^2}}\, e+2 c x\right)\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e+2 c x\right)(d+e x)^{5/2}\,(a+x\,(b+c x))^{-1+p}$$

$$\left.\text{AppellF1}\left[\frac{5}{2},-p,-p,\frac{7}{2},\frac{2 c\,(d+e x)}{2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)},\frac{2 c\,(d+e x)}{2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)}\right]\right)\Bigg/$$

$$\left(40 c^2 e\left(-7\left(c d^2+e\,(-b d+a e)\right)\text{AppellF1}\left[\frac{5}{2},-p,-p,\frac{7}{2},\right.\right.\right.$$

$$\left.\frac{2 c\,(d+e x)}{2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)},\frac{2 c\,(d+e x)}{2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)}\right]+p\,(d+e x)$$

$$\left(\left(2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)\right)\text{AppellF1}\left[\frac{7}{2},1-p,-p,\frac{9}{2},\frac{2 c\,(d+e x)}{2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)},\right.\right.$$

$$\left.\frac{2 c\,(d+e x)}{2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)}\right]+\left(2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)\right)\text{AppellF1}\left[\frac{7}{2},\right.$$

$$\left.\left.\left.\left.\left.-p,1-p,\frac{9}{2},\frac{2 c\,(d+e x)}{2 c d-e\left(b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)},\frac{2 c\,(d+e x)}{2 c d+e\left(-b+\sqrt{\frac{b^2-4 a c}{e^2}}\, e\right)}\right]\right)\right)\right)\right)$$

Problem 2578: Attempted integration timed out after 120 seconds.

$$\int (d+e x)^{-4-2 p} \left(a+b x+c x^2\right)^p \, dx$$

Optimal (type 5, 442 leaves, 3 steps):

$$-\frac{e (d+e x)^{-3-2 p} \left(a+b x+c x^2\right)^{1+p}}{\left(c d^2-b d e+a e^2\right) (3+2 p)}-\frac{e (2 c d-b e) (2+p) (d+e x)^{-2 (1+p)} \left(a+b x+c x^2\right)^{1+p}}{2 \left(c d^2-b d e+a e^2\right)^2 (1+p) (3+2 p)}+$$
$$\left(\left(b^2 e^2 (2+p)+2 c^2 d^2 (3+2 p)-2 c e (a e+b d (3+2 p))\right)\right.$$
$$\left(b-\sqrt{b^2-4 a c}+2 c x\right) \left(\frac{\left(2 c d-\left(b-\sqrt{b^2-4 a c}\right) e\right) \left(b+\sqrt{b^2-4 a c}+2 c x\right)}{\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right) e\right) \left(b-\sqrt{b^2-4 a c}+2 c x\right)}\right)^{-p}$$
$$(d+e x)^{-1-2 p} \left(a+b x+c x^2\right)^p \text{Hypergeometric2F1}\left[-1-2 p,-p,\right.$$
$$\left.\left.-2 p,-\frac{4 c \sqrt{b^2-4 a c} (d+e x)}{\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right) e\right) \left(b-\sqrt{b^2-4 a c}+2 c x\right)}\right]\right)\Big/$$
$$\left(2 \left(2 c d-\left(b-\sqrt{b^2-4 a c}\right) e\right) \left(c d^2-b d e+a e^2\right)^2 (1+2 p) (3+2 p)\right)$$

Result (type 1, 1 leaves):

???

Problem 2579: Result more than twice size of optimal antiderivative.

$$\int (d+e x)^{-5-2 p} \left(a+b x+c x^2\right)^p \, dx$$

Optimal (type 5, 577 leaves, 4 steps):

$$-\frac{e\,(2\,c\,d-b\,e)\,(3+p)\,(d+e\,x)^{-3-2\,p}\,\left(a+b\,x+c\,x^2\right)^{1+p}}{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,(2+p)\,(3+2\,p)}-$$

$$\Big(e\,\left(b^2\,e^2\,\left(6+5\,p+p^2\right)+2\,c^2\,d^2\,\left(9+8\,p+2\,p^2\right)-2\,c\,e\,\left(a\,e\,(3+2\,p)+b\,d\,\left(9+8\,p+2\,p^2\right)\right)\right)$$
$$(d+e\,x)^{-2\,(1+p)}\,\left(a+b\,x+c\,x^2\right)^{1+p}\Big)\Big/$$
$$\left(4\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,(1+p)\,(2+p)\,(3+2\,p)\right)-\frac{e\,(d+e\,x)^{-2\,(2+p)}\,\left(a+b\,x+c\,x^2\right)^{1+p}}{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(2+p)}+$$

$$\Bigg(\,(2\,c\,d-b\,e)\,\left(b^2\,e^2\,(3+p)+2\,c^2\,d^2\,(3+2\,p)-2\,c\,e\,\left(3\,a\,e+b\,d\,(3+2\,p)\right)\right)$$
$$\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\right)^{-p}$$
$$(d+e\,x)^{-1-2\,p}\,\left(a+b\,x+c\,x^2\right)^p\,\text{Hypergeometric2F1}\Big[-1-2\,p,\,-p,$$
$$-2\,p,\,-\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,(d+e\,x)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]\Bigg)\Bigg/$$
$$\left(4\,\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,(1+2\,p)\,(3+2\,p)\right)$$

Result (type 5, 3457 leaves):

$$-\Bigg(\Bigg(2^{-2\,p}\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x\right)^{-p}\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x\right)^{-p}\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x}{c}\right)^p$$
$$\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x}{c}\right)^p(d+e\,x)^{-4-2\,p}\left(\frac{-b\,e-\sqrt{b^2-4\,a\,c}\,e-2\,c\,e\,x}{2\,c\,d-b\,e-\sqrt{b^2-4\,a\,c}\,e}\right)^{-p}$$
$$\left(\frac{-b\,e+\sqrt{b^2-4\,a\,c}\,e-2\,c\,e\,x}{2\,c\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}\right)^{-p}\left(a+b\,x+c\,x^2\right)^p\left(1-\frac{2\,c\,(d+e\,x)}{2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e}\right)^{1+p}$$
$$\left(1-\frac{2\,c\,(d+e\,x)}{2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right)^p\Bigg(-3\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e\right)^4p\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)$$
$$\text{Gamma}[-p]\,\text{Gamma}[-2\,(1+p)]\,\text{Hypergeometric2F1}\Big[1,\,-p,\,-3-2\,p,$$
$$\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-11\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e\right)^4$$
$$p^2\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\text{Gamma}[-p]\,\text{Gamma}[-2\,(1+p)]\,\text{Hypergeometric2F1}\Big[$$
$$1,\,-p,\,-3-2\,p,\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$
$$12\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)e\right)^4p^3\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\text{Gamma}[-p]$$
$$\text{Gamma}[-2\,(1+p)]\,\text{Hypergeometric2F1}\Big[1,\,-p,\,-3-2\,p,$$

$$\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-4\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^4$$

$$p^4\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[$$

$$1,\,-p,\,-3-2\,p,\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$12\,c^2\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^2\,p\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,(d+e\,x)^2$$

$$\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[1,\,-p,$$

$$-1-2\,p,\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$24\,c^2\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^2\,p^2\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,(d+e\,x)^2$$

$$\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[1,\,-p,$$

$$-1-2\,p,\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$24\,c^3\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,p\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)$$

$$(d+e\,x)^3\,\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]$$

$$\text{Hypergeometric2F1}\Big[1,\,-p,\,-2\,p,\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$6\,c\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^3\,p\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,(d+e\,x)$$

$$\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[1,\,-p,$$

$$-2\,(1+p),\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$18\,c\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^3\,p^2\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,(d+e\,x)$$

$$\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[1,\,-p,$$

$$-2\,(1+p),\,\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-$$

$$12\,c\,\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^3\,p^3\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,(d+e\,x)$$

$$\text{Gamma}[-p]\,\text{Gamma}\big[-2\,(1+p)\big]\,\text{Hypergeometric2F1}\Big[1,\,-p,\,-2\,(1+p),$$

$$\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,\,(d+e\,x)}{\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]-36\,c^2\,\sqrt{b^2-4\,a\,c}$$

$$\left(2\,c\,d+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,e\right)^2\,p\,(d+e\,x)^2\,\text{Gamma}[-3-2\,p]\,\text{Gamma}[1-p]\,\text{Hypergeometric2F1}\Big[$$

$$2,\ 1-p,\ -1-2p,\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$96c^2\sqrt{b^2-4ac}\ \left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)^2 p^2\ (d+ex)^2\ \text{Gamma}[-3-2p]$$
$$\text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[2,\ 1-p,\ -1-2p,$$
$$\frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$48c^2\sqrt{b^2-4ac}\ \left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)^2 p^3\ (d+ex)^2\ \text{Gamma}[-3-2p]$$
$$\text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[2,\ 1-p,\ -1-2p,$$
$$\frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$264c^4\sqrt{b^2-4ac}\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[$$
$$2,\ 1-p,\ 1-2p,\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$176c^4\sqrt{b^2-4ac}\ p\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[$$
$$2,\ 1-p,\ 1-2p,\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$216c^3\sqrt{b^2-4ac}\ \left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right) p\ (d+ex)^3\ \text{Gamma}[-3-2p]$$
$$\text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[2,\ 1-p,\ -2p,$$
$$\frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] - 144c^3\sqrt{b^2-4ac}$$
$$\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right) p^2\ (d+ex)^3\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{Hypergeometric2F1}\Big[$$
$$2,\ 1-p,\ -2p,\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$144c^4\sqrt{b^2-4ac}\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[$$
$$\{2,\ 2,\ 1-p\},\ \{1,\ 1-2p\},\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$96c^4\sqrt{b^2-4ac}\ p\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[$$
$$\{2,\ 2,\ 1-p\},\ \{1,\ 1-2p\},\ \frac{4c\sqrt{b^2-4ac}\ (d+ex)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big] -$$

$$72c^3\sqrt{b^2-4ac}\ \left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right) p\ (d+ex)^3\ \text{Gamma}[-3-2p]$$

$$\text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[\{2,2,1-p\},\{1,-2p\},\frac{4c\sqrt{b^2-4ac}\ (d+e x)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big]-$$

$$48c^3\sqrt{b^2-4ac}\ \left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)p^2\ (d+ex)^3\ \text{Gamma}[-3-2p]$$

$$\text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[\{2,2,1-p\},\{1,-2p\},\frac{4c\sqrt{b^2-4ac}\ (d+e x)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big]-$$

$$24c^4\sqrt{b^2-4ac}\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[\{2,2,2,1-p\},\{1,1,1-2p\},\frac{4c\sqrt{b^2-4ac}\ (d+e x)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big]-$$

$$16c^4\sqrt{b^2-4ac}\ p\ (d+ex)^4\ \text{Gamma}[-3-2p]\ \text{Gamma}[1-p]\ \text{HypergeometricPFQ}\Big[\{2,2,2,1-p\},\{1,1,1-2p\},\frac{4c\sqrt{b^2-4ac}\ (d+e x)}{\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)\left(b+\sqrt{b^2-4ac}+2cx\right)}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(e\left(2cd+\left(-b+\sqrt{b^2-4ac}\right)e\right)^4(-4-2p)\ p\ (1+p)\ (1+2p)\ (3+2p)\left(b+\sqrt{b^2-4ac}+2cx\right)\text{Gamma}[-p]\ \text{Gamma}[-2(1+p)]\Bigg)$$

Problem 2580: Attempted integration timed out after 120 seconds.

$$\int (d+e x)^{-6-2p}\left(a+b x+c x^2\right)^p\, dx$$

Optimal (type 5, 809 leaves, 5 steps):

$$-\frac{e\,(d+e\,x)^{-5-2\,p}\,\left(a+b\,x+c\,x^2\right)^{1+p}}{\left(c\,d^2-b\,d\,e+a\,e^2\right)\,(5+2\,p)}-$$
$$\left(e\,\left(b^2\,e^2\,\left(12+7\,p+p^2\right)+2\,c^2\,d^2\,\left(18+11\,p+2\,p^2\right)-2\,c\,e\,\left(3\,a\,e\,(2+p)+b\,d\,\left(18+11\,p+2\,p^2\right)\right)\right)\right.$$
$$\left.(d+e\,x)^{-3-2\,p}\,\left(a+b\,x+c\,x^2\right)^{1+p}\right)\Big/\left(2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,(2+p)\,(3+2\,p)\,(5+2\,p)\right)-$$
$$\left(e\,(2\,c\,d-b\,e)\,(3+p)\,\left(b^2\,e^2\,\left(8+6\,p+p^2\right)+2\,c^2\,d^2\,\left(8+7\,p+2\,p^2\right)-\right.\right.$$
$$\left.\left.2\,c\,e\,\left(a\,e\,(8+5\,p)+b\,d\,\left(8+7\,p+2\,p^2\right)\right)\right)\,(d+e\,x)^{-2\,(1+p)}\,\left(a+b\,x+c\,x^2\right)^{1+p}\right)\Big/$$
$$\left(4\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^4\,(1+p)\,(2+p)\,(3+2\,p)\,(5+2\,p)\right)-$$
$$\frac{e\,(2\,c\,d-b\,e)\,(4+p)\,(d+e\,x)^{-2\,(2+p)}\,\left(a+b\,x+c\,x^2\right)^{1+p}}{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,(2+p)\,(5+2\,p)}+$$
$$\left(\left(b^4\,e^4\,\left(12+7\,p+p^2\right)+4\,c^4\,d^4\,\left(15+16\,p+4\,p^2\right)-8\,c^3\,d^2\,e\,(5+2\,p)\,(3\,a\,e+b\,d\,(3+2\,p))-4\,b^2\,c\,e^3\right.\right.$$
$$\left.(3+p)\,(3\,a\,e+b\,d\,(5+2\,p))+12\,c^2\,e^2\,\left(a^2\,e^2+2\,a\,b\,d\,e\,(5+2\,p)+b^2\,d^2\,\left(10+9\,p+2\,p^2\right)\right)\right)$$
$$\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\,\left(\frac{\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\right)^{-p}$$
$$(d+e\,x)^{-1-2\,p}\,\left(a+b\,x+c\,x^2\right)^p\,\text{Hypergeometric2F1}\Big[-1-2\,p,\,-p,$$
$$\left.-2\,p,\,-\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,(d+e\,x)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]\right)\Big/$$
$$\left(4\,\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)\,e\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^4\,(1+2\,p)\,(3+2\,p)\,(5+2\,p)\right)$$

Result (type 1, 1 leaves):

???

Problem 2581: Attempted integration timed out after 120 seconds.

$$\int (d+e\,x)^m\,\left(a+b\,x+c\,x^2\right)^{-2-\frac{m}{2}}\,dx$$

Optimal (type 5, 440 leaves, 3 steps):

$$\frac{e\,(d+e\,x)^{1+m}\,(a+b\,x+c\,x^2)^{-1-\frac{m}{2}}}{(c\,d^2-b\,d\,e+a\,e^2)\,(1+m)}+\frac{e\,(2\,c\,d-b\,e)\,m\,(d+e\,x)^{2+m}\,(a+b\,x+c\,x^2)^{-1-\frac{m}{2}}}{2\,(c\,d^2-b\,d\,e+a\,e^2)^2\,(1+m)\,(2+m)}-$$
$$\left((b^2\,e^2\,m+4\,c^2\,d^2\,(1+m)+4\,c\,e\,(a\,e-b\,d\,(1+m)))\right.$$
$$\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)\left(\frac{\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\right)^{\frac{4+m}{2}}$$
$$(d+e\,x)^{3+m}\,(a+b\,x+c\,x^2)^{-2-\frac{m}{2}}\,\text{Hypergeometric2F1}\Big[3+m,\,\frac{4+m}{2},$$
$$\left.4+m,\,-\frac{4\,c\,\sqrt{b^2-4\,a\,c}\,(d+e\,x)}{\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e\right)\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x\right)}\Big]\right)\Big/$$
$$\left(4\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e\right)(c\,d^2-b\,d\,e+a\,e^2)^2\,(1+m)\,(3+m)\right)$$

Result (type 1, 1 leaves):

???

Problem 2582: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{(1+x)^{1/3}\,(1-x+x^2)^{1/3}}\,dx$$

Optimal (type 3, 102 leaves, 2 steps):

$$\frac{(1+x^3)^{1/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,x}{(1+x^3)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,(1+x)^{1/3}\,(1-x+x^2)^{1/3}}-\frac{(1+x^3)^{1/3}\,\text{Log}\left[-x+(1+x^3)^{1/3}\right]}{2\,(1+x)^{1/3}\,(1-x+x^2)^{1/3}}$$

Result (type 6, 281 leaves):

$$\left(45\left(-i+\sqrt{3}+2\,i\,x\right)(1+x)^{2/3}\right.$$
$$\left.\left(-1+i\sqrt{3}+2\,x\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{2\,i\,(1+x)}{3\,i+\sqrt{3}},-\frac{2\,i\,(1+x)}{-3\,i+\sqrt{3}}\right]\right)\Big/$$
$$\left(4\,(1-x+x^2)^{4/3}\left(30\,i\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{2\,i\,(1+x)}{3\,i+\sqrt{3}},-\frac{2\,i\,(1+x)}{-3\,i+\sqrt{3}}\right]+\right.\right.$$
$$\left(3\,i+\sqrt{3}\right)(1+x)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},\frac{2\,i\,(1+x)}{3\,i+\sqrt{3}},-\frac{2\,i\,(1+x)}{-3\,i+\sqrt{3}}\right]-$$
$$\left.\left.\left(-3\,i+\sqrt{3}\right)(1+x)\,\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},\frac{2\,i\,(1+x)}{3\,i+\sqrt{3}},-\frac{2\,i\,(1+x)}{-3\,i+\sqrt{3}}\right]\right)\right)$$

Problem 2583: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(1+x)^{2/3}\left(1-x+x^2\right)^{2/3}}\,dx$$

Optimal (type 5, 45 leaves, 2 steps):

$$\frac{x\left(1+x^3\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},-x^3\right]}{(1+x)^{2/3}\left(1-x+x^2\right)^{2/3}}$$

Result (type 5, 148 leaves):

$$-\left(\left(\left(i+\sqrt{3}-2\,i\,x\right)(1+x)^{1/3}\left(-\frac{6\,i+\left(-3\,i+\sqrt{3}\right)(1+x)}{-6\,i+\left(3\,i+\sqrt{3}\right)(1+x)}\right)^{2/3}\left(-6\,i+\left(3\,i+\sqrt{3}\right)(1+x)\right)^2\right.\right.$$
$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{2\sqrt{3}\,(1+x)}{-6\,i+\left(3\,i+\sqrt{3}\right)(1+x)}\right]\right)\Big/\left(4\left(3\,i+\sqrt{3}\right)\left(1-x+x^2\right)^{5/3}\right)\right)$$

Problem 2584: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (1+x)^p\left(1-x+x^2\right)^p\,dx$$

Optimal (type 5, 41 leaves, 2 steps):

$$x\,(1+x)^p\left(1-x+x^2\right)^p\left(1+x^3\right)^{-p}\text{Hypergeometric2F1}\left[\frac{1}{3},-p,\frac{4}{3},-x^3\right]$$

Result (type 6, 132 leaves):

$$\frac{1}{1+p}\left(\frac{i+\sqrt{3}-2\,i\,x}{3\,i+\sqrt{3}}\right)^{-p}\left(\frac{-i+\sqrt{3}+2\,i\,x}{-3\,i+\sqrt{3}}\right)^{-p}(1+x)^{1+p}$$
$$\left(1-x+x^2\right)^p\,\text{AppellF1}\left[1+p,-p,-p,2+p,\frac{2\,i\,(1+x)}{3\,i+\sqrt{3}},-\frac{2\,i\,(1+x)}{-3\,i+\sqrt{3}}\right]$$

Problem 2585: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{(1-x)^{1/3}\left(1+x+x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 109 leaves, 2 steps):

$$-\frac{\left(1-x^3\right)^{1/3}\,\text{ArcTan}\left[\frac{1-\frac{2x}{\left(1-x^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,(1-x)^{1/3}\left(1+x+x^2\right)^{1/3}}+\frac{\left(1-x^3\right)^{1/3}\,\text{Log}\left[x+\left(1-x^3\right)^{1/3}\right]}{2\,(1-x)^{1/3}\left(1+x+x^2\right)^{1/3}}$$

Result (type 6, 280 leaves):

$$\left(45\,(1-x)^{2/3}\left(\mathrm{i}+\sqrt{3}+2\,\mathrm{i}\,x\right)\left(1+\mathrm{i}\,\sqrt{3}+2\,x\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{2\,\mathrm{i}\,(-1+x)}{3\,\mathrm{i}+\sqrt{3}},\frac{2\,\mathrm{i}\,(-1+x)}{-3\,\mathrm{i}+\sqrt{3}}\right]\right)\Big/$$
$$\left(4\left(1+x+x^2\right)^{4/3}\left(-30\,\mathrm{i}\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{2\,\mathrm{i}\,(-1+x)}{3\,\mathrm{i}+\sqrt{3}},\frac{2\,\mathrm{i}\,(-1+x)}{-3\,\mathrm{i}+\sqrt{3}}\right]+\right.\right.$$
$$(-1+x)\left(\left(3\,\mathrm{i}+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},\frac{4}{3},\frac{8}{3},-\frac{2\,\mathrm{i}\,(-1+x)}{3\,\mathrm{i}+\sqrt{3}},\frac{2\,\mathrm{i}\,(-1+x)}{-3\,\mathrm{i}+\sqrt{3}}\right]-\right.$$
$$\left.\left.\left.\left(-3\,\mathrm{i}+\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{4}{3},\frac{1}{3},\frac{8}{3},-\frac{2\,\mathrm{i}\,(-1+x)}{3\,\mathrm{i}+\sqrt{3}},\frac{2\,\mathrm{i}\,(-1+x)}{-3\,\mathrm{i}+\sqrt{3}}\right]\right)\right)\right)$$

Problem 2586: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(1-x)^{2/3}\left(1+x+x^2\right)^{2/3}}\,dx$$

Optimal (type 5, 45 leaves, 2 steps):

$$\frac{x\left(1-x^3\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},x^3\right]}{(1-x)^{2/3}\left(1+x+x^2\right)^{2/3}}$$

Result (type 5, 163 leaves):

$$\left((1-x)^{1/3}\left(\mathrm{i}+\sqrt{3}+2\,\mathrm{i}\,x\right)\left(\frac{3\,\mathrm{i}+\sqrt{3}-\left(-3\,\mathrm{i}+\sqrt{3}\right)x}{3\,\mathrm{i}-\sqrt{3}+\left(3\,\mathrm{i}+\sqrt{3}\right)x}\right)^{2/3}\left(3\,\mathrm{i}-\sqrt{3}+\left(3\,\mathrm{i}+\sqrt{3}\right)x\right)^2\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},-\frac{2\sqrt{3}\,(1-x)}{6\,\mathrm{i}+\left(3\,\mathrm{i}+\sqrt{3}\right)(-1+x)}\right]\right)\Big/\left(4\left(3\,\mathrm{i}+\sqrt{3}\right)\left(1+x+x^2\right)^{5/3}\right)$$

Problem 2587: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int(1-x)^p\left(1+x+x^2\right)^p\,dx$$

Optimal (type 5, 41 leaves, 2 steps):

$$(1-x)^p\,x\left(1+x+x^2\right)^p\left(1-x^3\right)^{-p}\,\text{Hypergeometric2F1}\left[\frac{1}{3},-p,\frac{4}{3},x^3\right]$$

Result (type 6, 133 leaves):

$$\frac{1}{1+p}(1-x)^p\left(\frac{-i+\sqrt{3}-2ix}{-3i+\sqrt{3}}\right)^{-p}\left(\frac{i+\sqrt{3}+2ix}{3i+\sqrt{3}}\right)^{-p}(-1+x)\left(1+x+x^2\right)^p \text{AppellF1}\left[1+p,-p,-p,2+p,\frac{2i(-1+x)}{-3i+\sqrt{3}},-\frac{2i(-1+x)}{3i+\sqrt{3}}\right]$$

Problem 2588: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(b e-c e x)^{1/3}\left(b^2+b c x+c^2 x^2\right)^{1/3}}\,dx$$

Optimal (type 3, 196 leaves, 2 steps):

$$-\frac{\left(b^3 e-c^3 e x^3\right)^{1/3}\text{ArcTan}\left[\frac{1-\frac{2 c e^{1/3} x}{\left(b^3 e-c^3 e x^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\, c e^{1/3}(b e-c e x)^{1/3}\left(b^2+b c x+c^2 x^2\right)^{1/3}}+\frac{\left(b^3 e-c^3 e x^3\right)^{1/3}\text{Log}\left[c e^{1/3} x+\left(b^3 e-c^3 e x^3\right)^{1/3}\right]}{2 c e^{1/3}(b e-c e x)^{1/3}\left(b^2+b c x+c^2 x^2\right)^{1/3}}$$

Result (type 6, 241 leaves):

$$-\left(\left(3\,(e\,(b-c x))^{2/3}\left(\frac{b c-\sqrt{3}\sqrt{-b^2 c^2}+2 c^2 x}{3 b c-\sqrt{3}\sqrt{-b^2 c^2}}\right)^{1/3}\left(\frac{b c+\sqrt{3}\sqrt{-b^2 c^2}+2 c^2 x}{3 b c+\sqrt{3}\sqrt{-b^2 c^2}}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{2 c\,(b-c x)}{3 b c+\sqrt{3}\sqrt{-b^2 c^2}},\frac{2 c\,(b-c x)}{3 b c-\sqrt{3}\sqrt{-b^2 c^2}}\right]\right)\Big/\left(2 c e\left(b^2+b c x+c^2 x^2\right)^{1/3}\right)\right)$$

Problem 2589: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{(b e-c e x)^{2/3}\left(b^2+b c x+c^2 x^2\right)^{2/3}}\,dx$$

Optimal (type 5, 71 leaves, 3 steps):

$$\frac{x\left(1-\frac{c^3 x^3}{b^3}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{c^3 x^3}{b^3}\right]}{(b e-c e x)^{2/3}\left(b^2+b c x+c^2 x^2\right)^{2/3}}$$

Result (type 5, 232 leaves):

$$-\left(\left(3\,(e\,(b-c x))^{1/3}\left(\frac{b c+\sqrt{3}\sqrt{-b^2 c^2}+2 c^2 x}{3 b c+\sqrt{3}\sqrt{-b^2 c^2}}\right)^{2/3}\left(1+\frac{2 c\,(-b+c x)}{3 b c-\sqrt{3}\sqrt{-b^2 c^2}}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},-\frac{4\sqrt{3}\, c\sqrt{-b^2 c^2}\,(-b+c x)}{\left(3 b c+\sqrt{3}\sqrt{-b^2 c^2}\right)\left(-b c+\sqrt{3}\sqrt{-b^2 c^2}-2 c^2 x\right)}\right]\right)\Big/\left(c e\left(b^2+b c x+c^2 x^2\right)^{2/3}\right)\right)$$

Problem 2590: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (b\,e - c\,e\,x)^p\,(b^2 + b\,c\,x + c^2\,x^2)^p\,dx$$

Optimal (type 5, 67 leaves, 3 steps):

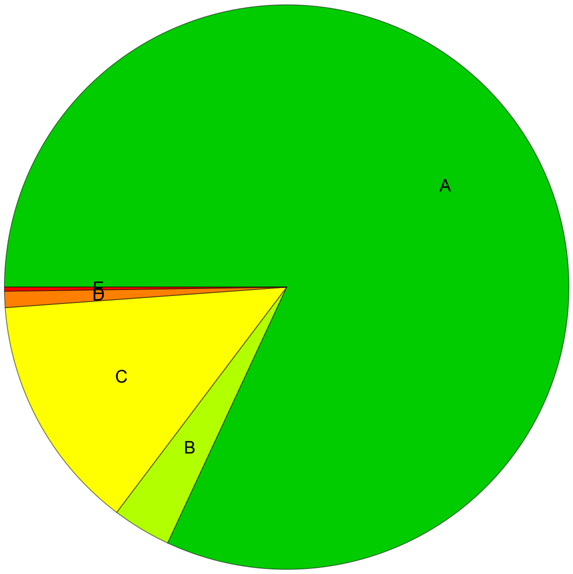
$$x\,(b\,e - c\,e\,x)^p\,(b^2 + b\,c\,x + c^2\,x^2)^p\left(1 - \frac{c^3\,x^3}{b^3}\right)^{-p}\text{Hypergeometric2F1}\left[\frac{1}{3}, -p, \frac{4}{3}, \frac{c^3\,x^3}{b^3}\right]$$

Result (type 6, 243 leaves):

$$\frac{1}{c\,(1+p)}\,(e\,(b - c\,x))^p\,(-b + c\,x)\left(\frac{b\,c - \sqrt{3}\,\sqrt{-b^2\,c^2} + 2\,c^2\,x}{3\,b\,c - \sqrt{3}\,\sqrt{-b^2\,c^2}}\right)^{-p}\left(\frac{b\,c + \sqrt{3}\,\sqrt{-b^2\,c^2} + 2\,c^2\,x}{3\,b\,c + \sqrt{3}\,\sqrt{-b^2\,c^2}}\right)^{-p}$$
$$(b^2 + b\,c\,x + c^2\,x^2)^p\,\text{AppellF1}\left[1 + p, -p, -p, 2 + p, \frac{2\,c\,(b - c\,x)}{3\,b\,c + \sqrt{3}\,\sqrt{-b^2\,c^2}}, \frac{2\,c\,(b - c\,x)}{3\,b\,c - \sqrt{3}\,\sqrt{-b^2\,c^2}}\right]$$

Summary of Integration Test Results

2590 integration problems



A - 2122 optimal antiderivatives

B - 87 more than twice size of optimal antiderivatives

C - 351 unnecessarily complex antiderivatives

D - 24 unable to integrate problems

E - 6 integration timeouts