Mathematica 11.3 Integration Test Results

Test results for the 190 problems in "7.5.1 u (a+b arcsech(c x))^n.m"

Problem 19: Result unnecessarily involves imaginary or complex numbers.

$$\int x^6 \left(a + b \operatorname{ArcSech}[c\,x]\right) dx$$

Optimal (type 3, 142 leaves, 8 steps):

$$-\frac{5\,b\,x\,\sqrt{1-c\,x}}{112\,c^6\,\sqrt{\frac{1}{1+c\,x}}}-\frac{5\,b\,x^3\,\sqrt{1-c\,x}}{168\,c^4\,\sqrt{\frac{1}{1+c\,x}}}-\frac{b\,x^5\,\sqrt{1-c\,x}}{42\,c^2\,\sqrt{\frac{1}{1+c\,x}}}+\frac{1}{7}\,x^7\,\left(a+b\operatorname{ArcSech}[c\,x]\right)+\frac{5\,b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\operatorname{ArcSin}[c\,x]}{112\,c^7}$$

Result (type 3, 143 leaves):

$$\frac{a\,x^7}{7}+b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(-\frac{5\,x}{112\,c^6}-\frac{5\,x^2}{112\,c^5}-\frac{5\,x^3}{168\,c^4}-\frac{5\,x^4}{168\,c^3}-\frac{x^5}{42\,c^2}-\frac{x^6}{42\,c}\right)+\frac{1}{7}\,b\,x^7\operatorname{ArcSech}[c\,x]+\frac{5\,i\,b\,\operatorname{Log}\left[-2\,i\,c\,x+2\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\right]}{112\,c^7}$$

Problem 21: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4 \left(a + b \operatorname{ArcSech}[c\,x]\right) dx$$

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

$$-\frac{3\,b\,x\,\sqrt{1-c\,x}}{40\,c^4\,\sqrt{\frac{1}{1+c\,x}}}-\frac{b\,x^3\,\sqrt{1-c\,x}}{20\,c^2\,\sqrt{\frac{1}{1+c\,x}}}+\frac{1}{5}\,x^5\,\left(a+b\operatorname{ArcSech}[c\,x]\right)+\frac{3\,b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\operatorname{ArcSin}[c\,x]}{40\,c^5}$$

Result (type 3, 123 leaves):

$$\frac{a x^5}{5}+b\sqrt{\frac{1-c x}{1+c x}}\left(-\frac{3 x}{40 c^4}-\frac{3 x^2}{40 c^3}-\frac{x^3}{20 c^2}-\frac{x^4}{20 c}\right)+\frac{1}{5} b x^5 \text{ArcSech}[c x]+\frac{3 i b \text{Log}\left[-2 i c x+2\sqrt{\frac{1-c x}{1+c x}}(1+c x)\right]}{40 c^5}$$

Problem 23: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 (a+b \text{ArcSech}[c x])\, dx$$

Optimal (type 3, 78 leaves, 4 steps):

$$-\frac{b x \sqrt{1-c x}}{6 c^2\sqrt{\frac{1}{1+c x}}}+\frac{1}{3} x^3 (a+b \text{ArcSech}[c x])+\frac{b\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\,\text{ArcSin}[c x]}{6 c^3}$$

Result (type 3, 103 leaves):

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

Problem 45: Result more than twice size of optimal antiderivative.

$$\int (a+b \text{ArcSech}[c x])^3\, dx$$

Optimal (type 4, 140 leaves, 9 steps):

$$x (a+b \text{ArcSech}[c x])^3-\frac{6 b (a+b \text{ArcSech}[c x])^2 \text{ArcTan}\left[e^{\text{ArcSech}[c x]}\right]}{c}+\frac{6 i b^2 (a+b \text{ArcSech}[c x]) \text{PolyLog}\left[2,-i e^{\text{ArcSech}[c x]}\right]}{c}-\frac{6 i b^2 (a+b \text{ArcSech}[c x]) \text{PolyLog}\left[2,i e^{\text{ArcSech}[c x]}\right]}{c}-\frac{6 i b^3 \text{PolyLog}\left[3,-i e^{\text{ArcSech}[c x]}\right]}{c}+\frac{6 i b^3 \text{PolyLog}\left[3,i e^{\text{ArcSech}[c x]}\right]}{c}$$

Result (type 4, 282 leaves):

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

Problem 71: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d x)^m (a+b \text{ArcSech}[c x]) \, dx$$

Optimal (type 5, 87 leaves, 3 steps):

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

Result (type 6, 183 leaves):

$$\frac{1}{1+m}(d x)^m \left(a x-\left(12 b \sqrt{\frac{1-c x}{1+c x}} (1+c x) \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\Big/\left(c (-1+c x) \left(6 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]+(1+c x) \left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right)\right)+b x \text{ArcSech}[c x]\right)$$

Problem 74: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e x)^3 (a+b \text{ArcSech}[c x]) \, dx$$

Optimal (type 3, 264 leaves, 9 steps):

$$-\frac{b\, e \left(9 c^2 d^2+e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{6 c^4}-\frac{b\, d\, e^2 x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{2 c^2}-\frac{b\, e^3 x^2 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{12 c^2}+\frac{(d+e x)^4 (a+b \,\text{ArcSech}[c x])}{4 e}+\frac{b\, d \left(2 c^2 d^2+e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\, \text{ArcSin}[c x]}{2 c^3}-\frac{b\, d^4 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\, \text{ArcTanh}\left[\sqrt{1-c^2 x^2}\right]}{4 e}$$

Result (type 3, 190 leaves):

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

Problem 75: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e x)^2 (a+b \,\text{ArcSech}[c x])\, dx$$

Optimal (type 3, 201 leaves, 8 steps):

$$-\frac{b\, d\, e \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{c^2}-\frac{b\, e^2 x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{6 c^2}+\frac{(d+e x)^3 (a+b \,\text{ArcSech}[c x])}{3 e}+\frac{b \left(6 c^2 d^2+e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\, \text{ArcSin}[c x]}{6 c^3}-\frac{b\, d^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\, \text{ArcTanh}\left[\sqrt{1-c^2 x^2}\right]}{3 e}$$

Result (type 3, 147 leaves):

$$\frac{1}{6 c^3}\left(-b c e \sqrt{\frac{1-c x}{1+c x}} (1+c x) (6 d+e x)+2 a c^3 x \left(3 d^2+3 d e x+e^2 x^2\right)+ 2 b c^3 x \left(3 d^2+3 d e x+e^2 x^2\right) \text{ArcSech}[c x]+i b \left(6 c^2 d^2+e^2\right) \text{Log}\left[-2 i c x+2 \sqrt{\frac{1-c x}{1+c x}} (1+c x)\right]\right)$$

Problem 78: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b \text{ArcSech}[c x]}{d+e x} \, dx$$

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

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

Result (type 4, 393 leaves):

$$\frac{a\,\text{Log}[d+e\,x]}{e}+\frac{1}{2\,e}b\left(\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c\,x]}\right]-\right.$$

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

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{e}{c\,d}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{\left(e+\sqrt{-c^2\,d^2+e^2}\right)e^{-\text{ArcSech}[c\,x]}}{c\,d}\right]+\text{PolyLog}\left[2,\right.$$

$$\left.\left.\left.\frac{\left(-e+\sqrt{-c^2\,d^2+e^2}\right)e^{-\text{ArcSech}[c\,x]}}{c\,d}\right]+\text{PolyLog}\left[2,-\frac{\left(e+\sqrt{-c^2\,d^2+e^2}\right)e^{-\text{ArcSech}[c\,x]}}{c\,d}\right]\right)\right)$$

Problem 80: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,\text{ArcSech}[c\,x]}{(d+e\,x)^3}\,dx$$

Optimal (type 3, 306 leaves, 11 steps):

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

Result (type 3, 342 leaves) :

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

Problem 81: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 343 leaves, 21 steps) :

$$-\frac{4\,b\,e\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{d+e\,x}\,\sqrt{1-c^2\,x^2}}{15\,c^2}+\frac{2\,(d+e\,x)^{5/2}\,(a+b\,\text{ArcSech}[c\,x])}{5\,e}-$$

$$\frac{28\,b\,d\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-c\,x}}{\sqrt{2}}\right],\frac{2\,e}{c\,d+e}\right]}{15\,c\,\sqrt{\frac{c\,(d+e\,x)}{c\,d+e}}}-\frac{1}{15\,c^3\,\sqrt{d+e\,x}}$$

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

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

Result (type 4, 575 leaves) :

$$-\frac{4\,b\,e\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)\,\sqrt{d+e\,x}}{15\,c^2}+\frac{2\,a\,(d+e\,x)^{5/2}}{5\,e}+$$

$$\frac{2\,b\,(d+e\,x)^{5/2}\,\text{ArcSech}[c\,x]}{5\,e}+\frac{1}{15\,c^2\,\sqrt{-\frac{c\,d+e}{c}}\,\sqrt{d+e\,x}\,(e-c\,e\,x)}$$

$$4\,b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\Bigg(7\,c^2\,d^3\,\sqrt{-\frac{c\,d+e}{c}}-7\,d\,e^2\,\sqrt{-\frac{c\,d+e}{c}}-14\,c^2\,d^2\,\sqrt{-\frac{c\,d+e}{c}}\,(d+e\,x)+$$

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

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

$$\mathrm{i}\,(6\,c^2\,d^2+7\,c\,d\,e+e^2)\,\sqrt{\frac{e\,(-1+c\,x)}{c\,(d+e\,x)}}\,(d+e\,x)^{3/2}\,\sqrt{\frac{e+c\,e\,x}{c\,d+c\,e\,x}}$$

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

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

Problem 82: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{d+e\,x}\,(a+b\,\text{ArcSech}[c\,x])\,dx$$

Optimal (type 4, 279 leaves, 14 steps):

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

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

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

Result (type 4, 279 leaves) :

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

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

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

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

Problem 83: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,\text{ArcSech}[c\,x]}{\sqrt{d+e\,x}}\,dx$$

Optimal (type 4, 187 leaves, 8 steps) :

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

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

Result (type 4, 286 leaves):

$$\left(2\sqrt{d+e\,x}\right.$$

$$\left(\left(-1+c\,x\right)\sqrt{-\frac{c\,(d+e\,x)}{c\,d+e}}\,\left(a+b\,\text{ArcSech}[c\,x]\right)+2\,i\,b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\sqrt{\frac{e\,(1+c\,x)}{-c\,d+e}}\,\sqrt{\frac{e-c\,e\,x}{c\,d+e}}\right.$$

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

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

Problem 84: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 105 leaves, 5 steps):

$$-\frac{2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{e\,\sqrt{d+e\,x}}+\frac{4\,b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{\frac{c\,(d+e\,x)}{c\,d+e}}\,\text{EllipticPi}\left[2,\text{ArcSin}\left[\frac{\sqrt{1-c\,x}}{\sqrt{2}}\right],\frac{2\,e}{c\,d+e}\right]}{e\,\sqrt{d+e\,x}}$$

Result (type 4, 223 leaves):

$$-\frac{2\,a}{e\sqrt{d+e\,x}}-\frac{2\,b\,\text{ArcSech}[c\,x]}{e\sqrt{d+e\,x}}-\left(4\,i\,b\sqrt{\frac{1-c\,x}{1+c\,x}}\sqrt{\frac{e+c\,e\,x}{c\,d+c\,e\,x}}\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\frac{c\,d+e}{c}}}{\sqrt{d+e\,x}}\right],\frac{c\,d-e}{c\,d+e}\right]-\text{EllipticPi}\left[\frac{c\,d}{c\,d+e},i\,\text{ArcSinh}\left[\frac{\sqrt{-\frac{c\,d+e}{c}}}{\sqrt{d+e\,x}}\right],\frac{c\,d-e}{c\,d+e}\right]\right)\right)\Bigg/\left(c\,d\sqrt{-\frac{c\,d+e}{c}}\sqrt{\frac{e\,(-1+c\,x)}{c\,(d+e\,x)}}\right)$$

Problem 85: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 278 leaves, 11 steps):

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

Result (type 4, 698 leaves):

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

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

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

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

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

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

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

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

Problem 86: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,\text{ArcSech}[c\,x]}{(d+e\,x)^{7/2}}\,dx$$

Optimal (type 4, 609 leaves, 18 steps):

$$\frac{4\,b\,e\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{15\,d\,\left(c^2\,d^2-e^2\right)\,\left(d+e\,x\right)^{3/2}}+\frac{16\,b\,c^2\,e\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{15\,\left(c^2\,d^2-e^2\right)^2\,\sqrt{d+e\,x}}+$$

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

$$\frac{16\,b\,c^3\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{d+e\,x}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-c\,x}}{\sqrt{2}}\right],\frac{2\,e}{c\,d+e}\right]}{15\,\left(c^2\,d^2-e^2\right)^2\,\sqrt{\frac{c\,(d+e\,x)}{c\,d+e}}}-$$

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

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

$$\frac{4\,b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{\frac{c\,(d+e\,x)}{c\,d+e}}\,\text{EllipticPi}\left[2,\text{ArcSin}\left[\frac{\sqrt{1-c\,x}}{\sqrt{2}}\right],\frac{2\,e}{c\,d+e}\right]}{5\,d^2\,e\,\sqrt{d+e\,x}}$$

Result (type 4, 1193 leaves):

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

$$\left(\frac{4\,b\,c\,\left(7\,c^2\,d^2-3\,e^2\right)}{15\,d^2\,\left(c^2\,d^2-e^2\right)^2}-\frac{4\,b}{15\,d\,\left(c\,d+e\right)\,\left(d+e\,x\right)^2}-\frac{4\,b\,\left(6\,c^2\,d^2-c\,d\,e-3\,e^2\right)}{15\,d^2\,\left(c\,d-e\right)\,\left(c\,d+e\right)^2\,\left(d+e\,x\right)}\right)-$$

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

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

$$\frac{10\,c^2\,d^3\,e^2\,\sqrt{-\frac{c\,d+e}{c}}}{(d+e\,x)^2}-\frac{3\,d\,e^4\,\sqrt{-\frac{c\,d+e}{c}}}{(d+e\,x)^2}+\frac{14\,c^4\,d^4\,\sqrt{-\frac{c\,d+e}{c}}}{d+e\,x}-\frac{6\,c^2\,d^2\,e^2\,\sqrt{-\frac{c\,d+e}{c}}}{d+e\,x}+$$

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

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

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

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

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

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

$$6\,i\,c^2\,d^2\,e^2\,\sqrt{1-\frac{d}{d+e\,x}-\frac{e}{c\,(d+e\,x)}}\,\sqrt{1-\frac{d}{d+e\,x}+\frac{e}{c\,(d+e\,x)}}\;\text{EllipticPi}\left[\frac{c\,d}{c\,d+e},\right.$$

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

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

Problem 88: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\,\left(d+e\,x^2\right)\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,dx$$

Optimal (type 3, 229 leaves, 6 steps):

$$-\frac{b\left(42 c^2 d+25 e\right) x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{560 c^6}-\frac{b\left(42 c^2 d+25 e\right) x^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{840 c^4}-\frac{b e x^5 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{42 c^2}+\frac{1}{5} d x^5 (a+b \text{ArcSech}[c x])+\frac{1}{7} e x^7 (a+b \text{ArcSech}[c x])+\frac{b\left(42 c^2 d+25 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ArcSin}[c x]}{560 c^7}$$

Result (type 3, 162 leaves):

$$\frac{1}{1680 c^7}\left(48 a c^7 x^5\left(7 d+5 e x^2\right)-b c x \sqrt{\frac{1-c x}{1+c x}}(1+c x)\left(75 e+2 c^2\left(63 d+25 e x^2\right)+c^4\left(84 d x^2+40 e x^4\right)\right)+48 b c^7 x^5\left(7 d+5 e x^2\right) \text{ArcSech}[c x]+3 i b\left(42 c^2 d+25 e\right) \text{Log}\left[-2 i c x+2 \sqrt{\frac{1-c x}{1+c x}}(1+c x)\right]\right)$$

Problem 89: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\left(d+e x^2\right)(a+b \text{ArcSech}[c x])\, dx$$

Optimal (type 3, 174 leaves, 5 steps):

$$-\frac{b\left(20 c^2 d+9 e\right) x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{120 c^4}-\frac{b e x^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{20 c^2}+\frac{1}{3} d x^3 (a+b \text{ArcSech}[c x])+\frac{1}{5} e x^5 (a+b \text{ArcSech}[c x])+\frac{b\left(20 c^2 d+9 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ArcSin}[c x]}{120 c^5}$$

Result (type 3, 144 leaves):

$$\frac{1}{120\,c^5}\left(8\,a\,c^5\,x^3\,\left(5\,d+3\,e\,x^2\right)-b\,c\,x\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\,\left(9\,e+c^2\,\left(20\,d+6\,e\,x^2\right)\right)+8\,b\,c^5\,x^3\,\left(5\,d+3\,e\,x^2\right)\,\text{ArcSech}[c\,x]+i\,b\,\left(20\,c^2\,d+9\,e\right)\,\text{Log}\left[-2\,i\,c\,x+2\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\right]\right)$$

Problem 90: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(d+e\,x^2\right)\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,dx$$

Optimal (type 3, 112 leaves, 4 steps):

$$-\frac{b\,e\,x\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{6\,c^2}+d\,x\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{1}{3}\,e\,x^3\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{b\,\left(6\,c^2\,d+e\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcSin}[c\,x]}{6\,c^3}$$

Result (type 3, 181 leaves):

$$a\,d\,x+\frac{1}{3}\,a\,e\,x^3+b\,e\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(-\frac{x}{6\,c^2}-\frac{x^2}{6\,c}\right)+b\,d\,x\,\text{ArcSech}[c\,x]+\frac{1}{3}\,b\,e\,x^3\,\text{ArcSech}[c\,x]+\frac{2\,b\,d\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\sqrt{1-c^2\,x^2}\,\text{ArcSin}\left[\frac{\sqrt{1+c\,x}}{\sqrt{2}}\right]}{c-c^2\,x}+\frac{i\,b\,e\,\text{Log}\left[-2\,i\,c\,x+2\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\right]}{6\,c^3}$$

Problem 100: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\,\left(d+e\,x^2\right)^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,dx$$

Optimal (type 3, 275 leaves, 6 steps):

$$-\frac{b\left(280 c^4 d^2+252 c^2 d e+75 e^2\right) x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{1680 c^6}-$$

$$\frac{b e\left(84 c^2 d+25 e\right) x^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{840 c^4}-\frac{b e^2 x^5 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{42 c^2}+$$

$$\frac{1}{3} d^2 x^3 (a+b \operatorname{ArcSech}[c x])+\frac{2}{5} d e x^5 (a+b \operatorname{ArcSech}[c x])+\frac{1}{7} e^2 x^7 (a+b \operatorname{ArcSech}[c x])+$$

$$\frac{b\left(280 c^4 d^2+252 c^2 d e+75 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcSin}[c x]}{1680 c^7}$$

Result (type 3, 207 leaves):

$$\frac{1}{1680 c^7}\left(16 a c^7 x^3\left(35 d^2+42 d e x^2+15 e^2 x^4\right)-\right.$$

$$b c x \sqrt{\frac{1-c x}{1+c x}}(1+c x)\left(75 e^2+2 c^2 e\left(126 d+25 e x^2\right)+8 c^4\left(35 d^2+21 d e x^2+5 e^2 x^4\right)\right)+$$

$$16 b c^7 x^3\left(35 d^2+42 d e x^2+15 e^2 x^4\right) \operatorname{ArcSech}[c x]+$$

$$\left.i b\left(280 c^4 d^2+252 c^2 d e+75 e^2\right) \operatorname{Log}\left[-2 i c x+2 \sqrt{\frac{1-c x}{1+c x}}(1+c x)\right]\right)$$

Problem 101: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(d+e x^2\right)^2(a+b \operatorname{ArcSech}[c x]) \, dx$$

Optimal (type 3, 204 leaves, 5 steps):

$$-\frac{b e\left(40 c^2 d+9 e\right) x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{120 c^4}-\frac{b e^2 x^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{20 c^2}+$$

$$d^2 x (a+b \operatorname{ArcSech}[c x])+\frac{2}{3} d e x^3 (a+b \operatorname{ArcSech}[c x])+\frac{1}{5} e^2 x^5 (a+b \operatorname{ArcSech}[c x])+$$

$$\frac{b\left(120 c^4 d^2+40 c^2 d e+9 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcSin}[c x]}{120 c^5}$$

Result (type 3, 174 leaves):

$$\frac{1}{120\,c^5}\left(8\,a\,c^5\,x\,\left(15\,d^2+10\,d\,e\,x^2+3\,e^2\,x^4\right)-b\,c\,e\,x\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\,\left(9\,e+c^2\,\left(40\,d+6\,e\,x^2\right)\right)+8\,b\,c^5\,x\,\left(15\,d^2+10\,d\,e\,x^2+3\,e^2\,x^4\right)\,\text{ArcSech}[c\,x]+i\,b\,\left(120\,c^4\,d^2+40\,c^2\,d\,e+9\,e^2\right)\,\text{Log}\left[-2\,i\,c\,x+2\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\right]\right)$$

Problem 102: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(d+e\,x^2\right)^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x^2}\,dx$$

Optimal (type 3, 177 leaves, 5 steps):

$$\frac{b\,d^2\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{x}-\frac{b\,e^2\,x\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{6\,c^2}-\frac{d^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x}+2\,d\,e\,x\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{1}{3}\,e^2\,x^3\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{b\,e\,\left(12\,c^2\,d+e\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcSin}[c\,x]}{6\,c^3}$$

Result (type 3, 158 leaves):

$$\frac{1}{6\,c^3\,x}\left(-b\,c\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\,\left(-6\,c^2\,d^2+e^2\,x^2\right)+2\,a\,c^3\,\left(-3\,d^2+6\,d\,e\,x^2+e^2\,x^4\right)+2\,b\,c^3\,\left(-3\,d^2+6\,d\,e\,x^2+e^2\,x^4\right)\,\text{ArcSech}[c\,x]+i\,b\,e\,\left(12\,c^2\,d+e\right)\,x\,\text{Log}\left[-2\,i\,c\,x+2\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\right]\right)$$

Problem 103: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(d+e\,x^2\right)^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x^4}\,dx$$

Optimal (type 3, 176 leaves, 5 steps):

$$\frac{b\,d^2\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{9\,x^3}+\frac{2\,b\,d\,\left(c^2\,d+9\,e\right)\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{9\,x}-\frac{d^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{3\,x^3}-\frac{2\,d\,e\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x}+e^2\,x\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{b\,e^2\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcSin}[c\,x]}{c}$$

Result (type 3, 149 leaves):

$$\frac{1}{9\,c\,x^3}\left(b\,c\,d\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)\,\left(d+2\,c^2\,d\,x^2+18\,e\,x^2\right)-3\,a\,c\,\left(d^2+6\,d\,e\,x^2-3\,e^2\,x^4\right)-3\,b\,c\,\left(d^2+6\,d\,e\,x^2-3\,e^2\,x^4\right)\,\text{ArcSech}[c\,x]+9\,i\,b\,e^2\,x^3\,\text{Log}\left[-2\,i\,c\,x+2\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)\right]\right)$$

Problem 110: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{d+e\,x^2}\,dx$$

Optimal (type 4, 519 leaves, 24 steps):

$$\frac{x\left(a+b\,\text{ArcSech}[c\,x]\right)}{e}-\frac{b\,\text{ArcTan}\left[\sqrt{-1+\frac{1}{c\,x}}\;\sqrt{1+\frac{1}{c\,x}}\right]}{c\,e}+$$

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

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

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

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

$$\frac{b\,\sqrt{-d}\;\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{2\,e^{3/2}}+\frac{b\,\sqrt{-d}\;\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{2\,e^{3/2}}-$$

$$\frac{b\,\sqrt{-d}\;\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e^{3/2}}+\frac{b\,\sqrt{-d}\;\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e^{3/2}}$$

Result (type 4, 921 leaves) :

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

$$b\left(4\,\sqrt{e}\;\left(c\,x\,\text{ArcSech}[c\,x]-2\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]\right]\right)-2\,i\,c\,\sqrt{d}\right.$$

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

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

$$\left.\frac{i\left(-\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\text{PolyLog}\left[2,-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\Bigg)+$$

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

$$\text{ArcSech}[c\,x]\,\text{Log}\left[1+e^{-2\,\text{ArcSech}[c\,x]}\right]-$$

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

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

Problem 111: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x\left(a+b\,\text{ArcSech}[c\,x]\right)}{d+e\,x^2}\,dx$$

Optimal (type 4, 441 leaves, 26 steps):

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{2\,e}+\frac{b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e}+$$

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e}-\frac{b\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSech}[c\,x]}\right]}{2\,e}$$

Result (type 4, 860 leaves):

$$\frac{1}{2\,e}\left(4\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]+\right.$$

$$4\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]-2\,b\,\text{ArcSech}[c\,x]$$

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

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

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

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

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

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

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

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

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

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

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

$$b\,\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]\Bigg)$$

Problem 112: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,\text{ArcSech}[c\,x]}{d+e\,x^2}\,dx$$

Optimal (type 4, 469 leaves, 19 steps):

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{2\,\sqrt{-d}\,\sqrt{e}}-\frac{b\,\text{PolyLog}\left[2,-\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,\sqrt{-d}\,\sqrt{e}}+\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,\sqrt{-d}\,\sqrt{e}}$$

Result (type 4, 849 leaves):

$$\frac{1}{2\sqrt{d}\,\sqrt{e}}$$

$$\Bigg(2\,a\,\text{ArcTan}\Big[\frac{\sqrt{e}\,x}{\sqrt{d}}\Big]-4\,b\,\text{ArcSin}\Big[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\text{ArcTanh}\Big[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\Big]+$$

$$4\,b\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\text{ArcTanh}\Big[\frac{\left(i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\Big]-$$

$$i\,b\,\text{ArcSech}[c\,x]\,\text{Log}\Big[1+\frac{i\left(\sqrt{e}-\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]-$$

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

$$i\,b\,\text{ArcSech}[c\,x]\,\text{Log}\Big[1+\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+$$

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

$$i\,b\,\text{ArcSech}[c\,x]\,\text{Log}\Big[1-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]-$$

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

$$i\,b\,\text{ArcSech}[c\,x]\,\text{Log}\Big[1+\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+$$

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

$$i\,b\,\text{PolyLog}\Big[2,\,\frac{i\left(\sqrt{e}-\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+$$

$$i\,b\,\text{PolyLog}\Big[2,\,\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+$$

$$\text{i b PolyLog}\left[2, -\frac{\text{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right) e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right] - \text{i b PolyLog}\left[2, \frac{\text{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right) e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\Bigg)$$

Problem 113: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x\left(d+e\,x^2\right)}\,dx$$

Optimal (type 4, 417 leaves, 19 steps):

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

Result (type 4, 841 leaves):

$$-\frac{1}{2\,d}\Bigg(b\,\text{ArcSech}[c\,x]^2 + 4\,\text{i}\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{\text{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(-\text{i}\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2 d+e}}\right] + 4\,\text{i}\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{\text{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(\text{i}\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2 d+e}}\right] + b\,\text{ArcSech}[c\,x]\,\text{Log}\left[1+\frac{\text{i}\left(\sqrt{e}-\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right] -$$

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

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

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

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

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

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

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

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

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

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

$$\left.b\,\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\right)$$

Problem 114: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^2\left(d+e\,x^2\right)}\,dx$$

Optimal (type 4, 523 leaves, 24 steps):

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

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

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

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

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

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

Result (type 4, 933 leaves):

$$\frac{1}{4\,d^{3/2}\,x}$$

$$\left(-4\,a\,\sqrt{d}-4\,a\,\sqrt{e}\,x\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]+b\left(4\,\sqrt{d}\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)-4\,\sqrt{d}\,\text{ArcSech}[c\,x]-2\,i\,\sqrt{e}\,x\right.\right.$$

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

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

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

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

$$2\,i\,\mathrm{ArcSin}\Big[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\mathrm{Log}\Big[1+\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+\mathrm{PolyLog}\Big[2,$$

$$\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+\mathrm{PolyLog}\Big[2,-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]\Bigg)+$$

$$2\,i\,\sqrt{e}\,x\,\Bigg(-4\,i\,\mathrm{ArcSin}\Big[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\mathrm{ArcTanh}\Big[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\mathrm{Tanh}\left[\frac{1}{2}\,\mathrm{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\Big]+$$

$$\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\left[1+e^{-2\,\mathrm{ArcSech}[c\,x]}\right]-$$

$$\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\Big[1+\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+$$

$$2\,i\,\mathrm{ArcSin}\Big[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\mathrm{Log}\Big[1+\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]-$$

$$\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\Big[1-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]-$$

$$2\,i\,\mathrm{ArcSin}\Big[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\Big]\,\mathrm{Log}\Big[1-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+\mathrm{PolyLog}\Big[2,$$

$$\frac{i\left(\sqrt{e}-\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]+\mathrm{PolyLog}\Big[2,\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\mathrm{ArcSech}[c\,x]}}{c\,\sqrt{d}}\Big]\Bigg)\Bigg)\Bigg)$$

Problem 115: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x^5\,\left(a+b\,\mathrm{ArcSech}[c\,x]\right)}{\left(d+e\,x^2\right)^2}\,dx$$

Optimal (type 4, 611 leaves, 32 steps):

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

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

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

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

$$\frac{b\,d\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{e^3}-\frac{b\,d\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{e^3}-$$

$$\frac{b\,d\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{e^3}-\frac{b\,d\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\;e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{e^3}+\frac{b\,d\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSech}[c\,x]}\right]}{e^3}$$

Result (type 4, 1397 leaves):

$$\frac{a\,x^2}{2\,e^2}-\frac{a\,d^2}{2\,e^3\left(d+e\,x^2\right)}-\frac{a\,d\,\text{Log}\left[d+e\,x^2\right]}{e^3}+$$

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

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

$$\frac{1}{4\,e^{5/2}}\,i\,d^{3/2}\left(-\frac{\text{ArcSech}[c\,x]}{-i\,\sqrt{d}\,\sqrt{e}+e\,x}-\frac{1}{\sqrt{d}}\,i\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c\,x}{1+c\,x}}+c\,x\,\sqrt{\frac{1-c\,x}{1+c\,x}}\right]}{\sqrt{e}}+\right.\right.$$

$$\frac{\text{Log}\left[\frac{2\sqrt{e}\left(i\sqrt{d}\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)+\frac{i\sqrt{d}\sqrt{e}+c^2\,d\,x}{\sqrt{c^2\,d+e}}\right)}{-i\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2\,d+e}}\Bigg)\Bigg) - \frac{1}{2\,e^3}\,d\,\Bigg(\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c\,x]}\right] -$$

$$2\Bigg(-4\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]+\text{ArcSech}[$$

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

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

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

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

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

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

$$\frac{1}{2\,e^3}\,d\,\Bigg(-\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c\,x]}\right]+2\Bigg(-4\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\Bigg[$$

$$\frac{\left(-i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\Bigg]+\text{ArcSech}[c\,x]\,\text{Log}\left[1+e^{-2\,\text{ArcSech}[c\,x]}\right]-$$

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\,\text{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)\,e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

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

Problem 116: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x^3\,(a+b\,\text{ArcSech}[c\,x])}{\left(d+e\,x^2\right)^2}\,dx$$

Optimal (type 4, 562 leaves, 30 steps):

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

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{2\,e^2}+\frac{b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e^2}+$$

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{2\,e^2}-\frac{b\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSech}[c\,x]}\right]}{2\,e^2}$$

Result (type 4, 1208 leaves):

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

$$8\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]+$$

$$8\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]-$$

$$4\,b\,\text{ArcSech}[c\,x]\,\text{Log}\left[1+e^{-2\,\text{ArcSech}[c\,x]}\right]+$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\left.2\,b\,\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\right)$$

Problem 117: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x\,(a+b\,\text{ArcSech}[c\,x])}{(d+e\,x^2)^2}\,dx$$

Optimal (type 3, 147 leaves, 8 steps):

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

Result (type 3, 345 leaves):

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

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

Problem 118: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x\,(d+e\,x^2)^2}\,dx$$

Optimal (type 4, 542 leaves, 25 steps):

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

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2d+e}}\right]}{2\,d^2}-\frac{b\,\text{PolyLog}\left[2,-\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2d+e}}\right]}{2\,d^2}-\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2d+e}}\right]}{2\,d^2}$$

Result (type 4, 1189 leaves):

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

$$8\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(-i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2d+e}}\right]-$$

$$8\,i\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2d+e}}\right]-$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\left.2\,b\,\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\right)$$

Problem 119: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4\left(a+b\,\text{ArcSech}[c\,x]\right)}{\left(d+e\,x^2\right)^2}\,dx$$

Optimal (type 4, 840 leaves, 50 steps):

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

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

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

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

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

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

$$\frac{3\,b\,\sqrt{-d}\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{4\,e^{5/2}}+\frac{3\,b\,\sqrt{-d}\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{4\,e^{5/2}}-$$

$$\frac{3\,b\,\sqrt{-d}\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{4\,e^{5/2}}+\frac{3\,b\,\sqrt{-d}\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{4\,e^{5/2}}$$

Result (type 4, 1270 leaves):

$$\frac{1}{4\,e^{5/2}}\left(4\,a\,\sqrt{e}\,x+\frac{2\,a\,d\,\sqrt{e}\,x}{d+e\,x^2}+4\,b\,\sqrt{e}\,x\,\text{ArcSech}[c\,x]+\frac{b\,d\,\text{ArcSech}[c\,x]}{-i\,\sqrt{d}+\sqrt{e}\,x}+\right.$$

$$\frac{b\,d\,\text{ArcSech}[c\,x]}{i\,\sqrt{d}+\sqrt{e}\,x}-6\,a\,\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]-\frac{8\,b\,\sqrt{e}\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]\right]}{c}+$$

$$12\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]-$$

$$12\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]+$$

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

$$6\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{i\left(\sqrt{e}-\sqrt{c^2\,d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]-$$

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

$$6\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{i\left(-\sqrt{e}+\sqrt{c^2\,d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]-$$

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

$$6\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]+$$

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

$$6\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\,\sqrt{d}}\right]-$$

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

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

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

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

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

$$3 i b \sqrt{d}\, \text{PolyLog}\left[2, \frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right]\Bigg)$$

Problem 120: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 (a+b\, \text{ArcSech}[c x])}{\left(d+e x^2\right)^2} \, dx$$

Optimal (type 4, 786 leaves, 27 steps):

$$\frac{a+b\, \text{ArcSech}[c x]}{4 e \left(\sqrt{-d} \sqrt{e}-\frac{d}{x}\right)}-\frac{a+b\, \text{ArcSech}[c x]}{4 e \left(\sqrt{-d} \sqrt{e}+\frac{d}{x}\right)}-\frac{b\, \text{ArcTan}\left[\frac{\sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{1+\frac{1}{c x}}}{\sqrt{c d+\sqrt{-d} \sqrt{e}} \sqrt{-1+\frac{1}{c x}}}\right]}{2 \sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{c d+\sqrt{-d} \sqrt{e}}\, e}-$$

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

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

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

$$\frac{b\, \text{PolyLog}\left[2,\frac{c \sqrt{-d}\, e^{\text{ArcSech}[c x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{4 \sqrt{-d}\, e^{3/2}}-\frac{b\, \text{PolyLog}\left[2,-\frac{c \sqrt{-d}\, e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{4 \sqrt{-d}\, e^{3/2}}+\frac{b\, \text{PolyLog}\left[2,\frac{c \sqrt{-d}\, e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{4 \sqrt{-d}\, e^{3/2}}$$

Result (type 4, 1226 leaves):

$$\frac{1}{4 e^{3/2}}\Bigg(-\frac{2 a \sqrt{e}\, x}{d+e x^2}+\frac{b\, \text{ArcSech}[c x]}{i \sqrt{d}-\sqrt{e}\, x}-\frac{b\, \text{ArcSech}[c x]}{i \sqrt{d}+\sqrt{e}\, x}+$$

$$\frac{2\,a\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{\sqrt{d}}-\frac{4\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(-i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]}{\sqrt{d}}+$$

$$\frac{4\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(i\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]}{\sqrt{d}}-$$

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

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

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

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

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

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

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

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

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

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

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

$$\left.\frac{i\, b\, \text{PolyLog}\left[2, -\frac{i \left(\sqrt{e} + \sqrt{c^2\, d+e}\right) e^{-\text{ArcSech}[c\,x]}}{c \sqrt{d}}\right]}{\sqrt{d}} - \frac{i\, b\, \text{PolyLog}\left[2, \frac{i \left(\sqrt{e} + \sqrt{c^2\, d+e}\right) e^{-\text{ArcSech}[c\,x]}}{c \sqrt{d}}\right]}{\sqrt{d}}\right)$$

Problem 121: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a + b\, \text{ArcSech}[c\, x]}{\left(d + e\, x^2\right)^2}\, dx$$

Optimal (type 4, 786 leaves, 47 steps):

$$-\frac{a+b\,\text{ArcSech}[c\,x]}{4\,d\left(\sqrt{-d}\,\sqrt{e}-\frac{d}{x}\right)}+\frac{a+b\,\text{ArcSech}[c\,x]}{4\,d\left(\sqrt{-d}\,\sqrt{e}+\frac{d}{x}\right)}+\frac{b\,\text{ArcTan}\left[\frac{\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{1+\frac{1}{c\,x}}}{\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,\sqrt{-1+\frac{1}{c\,x}}}\right]}{2\,d\,\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}}+$$

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

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

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

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

Result (type 4, 1216 leaves):

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

$$\frac{2\,a\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{\sqrt{e}}-\frac{4\,b\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]}{\sqrt{e}}+$$

$$\frac{4\,b\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]}{\sqrt{e}}-$$

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

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

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

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

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

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

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

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

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

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

$$\left.\frac{i\,b\,\text{PolyLog}\left[2,-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]}{\sqrt{e}}-\frac{i\,b\,\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]}{\sqrt{e}}\right)$$

Problem 122: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^2\,\left(d+e\,x^2\right)^2}\,dx$$

Optimal (type 4, 844 leaves, 50 steps):

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

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

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

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

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

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

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

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

Result (type 4, 1305 leaves):

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

$$\frac{b \sqrt{d}\, e \,\text{ArcSech}[c x]}{-i \sqrt{d} \sqrt{e} + e x} - \frac{b \sqrt{d}\, e \,\text{ArcSech}[c x]}{i \sqrt{d} \sqrt{e} + e x} - 6 a \sqrt{e}\, \text{ArcTan}\left[\frac{\sqrt{e}\, x}{\sqrt{d}}\right] +$$

$$12 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1-\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{ArcTanh}\left[\frac{\left(-i c \sqrt{d} + \sqrt{e}\right) \text{Tanh}\left[\frac{1}{2} \text{ArcSech}[c x]\right]}{\sqrt{c^2 d + e}}\right] -$$

$$12 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1+\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{ArcTanh}\left[\frac{\left(i c \sqrt{d} + \sqrt{e}\right) \text{Tanh}\left[\frac{1}{2} \text{ArcSech}[c x]\right]}{\sqrt{c^2 d + e}}\right] +$$

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

$$6 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1+\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1 + \frac{i \left(\sqrt{e} - \sqrt{c^2 d + e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right] -$$

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

$$6 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1-\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1 + \frac{i \left(-\sqrt{e} + \sqrt{c^2 d + e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right] -$$

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

$$6 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1-\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1 - \frac{i \left(\sqrt{e} + \sqrt{c^2 d + e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right] +$$

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

$$6 b \sqrt{e}\, \text{ArcSin}\left[\frac{\sqrt{1+\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1 + \frac{i \left(\sqrt{e} + \sqrt{c^2 d + e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right] +$$

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

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

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

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

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

Problem 123: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x^5\, (a+b\, \text{ArcSech}[c\, x])}{\left(d+e\, x^2\right)^3}\, dx$$

Optimal (type 4, 760 leaves, 35 steps):

$$\frac{b\,d\left(c^2-\frac{1}{x^2}\right)}{8\,c\,e^2\left(c^2 d+e\right)\left(e+\frac{d}{x^2}\right)\sqrt{-1+\frac{1}{c x}}\sqrt{1+\frac{1}{c x}}\,x}-\frac{a+b\,\text{ArcSech}[c\,x]}{4\,e\left(e+\frac{d}{x^2}\right)^2}-\frac{a+b\,\text{ArcSech}[c\,x]}{2\,e^2\left(e+\frac{d}{x^2}\right)}+$$

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

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{2\,e^3}+\frac{b\,\text{PolyLog}\left[2,-\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{2\,e^3}+$$

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{2\,e^3}-\frac{b\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSech}[c\,x]}\right]}{2\,e^3}$$

Result (type 4, 2000 leaves):

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

$$b\left(-\frac{1}{16\,e^{5/2}}d\left(-\frac{i\sqrt{e}\sqrt{\frac{1-c x}{1+c x}}\left(1+c\,x\right)}{\sqrt{d}\left(c^2 d+e\right)\left(-i\sqrt{d}+\sqrt{e}\,x\right)}-\frac{\text{ArcSech}[c\,x]}{\sqrt{e}\left(-i\sqrt{d}+\sqrt{e}\,x\right)^2}+\right.\right.$$

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

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

$$c\sqrt{c^2 d+e}\ x\sqrt{\frac{1-c x}{1+c x}}\Bigg)\Bigg)\Bigg/\left(\left(2 c^2 d+e\right)\left(-i\sqrt{d}+\sqrt{e}\ x\right)\right)\Bigg]\Bigg)-$$

$$\frac{1}{16 e^{5/2}}d\left(\frac{i\sqrt{e}\sqrt{\frac{1-c x}{1+c x}}\ (1+c x)}{\sqrt{d}\ \left(c^2 d+e\right)\left(i\sqrt{d}+\sqrt{e}\ x\right)}-\frac{\text{ArcSech}[c x]}{\sqrt{e}\ \left(i\sqrt{d}+\sqrt{e}\ x\right)^2}+\frac{\text{Log}[x]}{d\sqrt{e}}-\right.$$

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

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

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

$$\frac{1}{16 e^{5/2}}7 i\sqrt{d}\left(-\frac{\text{ArcSech}[c x]}{i\sqrt{d}\sqrt{e}+e x}+\frac{1}{\sqrt{d}}i\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x\sqrt{\frac{1-c x}{1+c x}}\right]}{\sqrt{e}}+\right.\right.$$

$$\left.\left.\frac{\text{Log}\left[\frac{2 i\sqrt{e}\left(\sqrt{d}\sqrt{\frac{1-c x}{1+c x}}\ (1+c x)+\frac{\sqrt{d}\sqrt{e}+i c^2 d x}{\sqrt{c^2 d+e}}\right)}{i\sqrt{d}+\sqrt{e}\ x}\right]}{\sqrt{c^2 d+e}}\right)\right)+\frac{1}{16 e^{5/2}}$$

$$7 i\sqrt{d}\left(-\frac{\text{ArcSech}[c x]}{-i\sqrt{d}\sqrt{e}+e x}-\frac{1}{\sqrt{d}}i\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x\sqrt{\frac{1-c x}{1+c x}}\right]}{\sqrt{e}}+\right.\right.$$

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

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

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

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

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

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

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

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

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

$$\left.\frac{\left(-i c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c x]\right]}{\sqrt{c^2 d+e}}\right]+\text{ArcSech}[c x]\,\text{Log}\left[1+e^{-2\,\text{ArcSech}[c x]}\right]-$$

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

$$\frac{i\left(\sqrt{e}-\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\Big]+\text{PolyLog}\left[2,\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\Bigg)\Bigg)\Bigg)$$

Problem 124: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x^3\,(a+b\,\text{ArcSech}[c\,x])}{\left(d+e\,x^2\right)^3}\,dx$$

Optimal (type 3, 173 leaves, 6 steps):

$$\frac{b\sqrt{\frac{1}{1+c\,x}}\sqrt{1+c\,x}\sqrt{1-c^2 x^2}}{8\,e\left(c^2 d+e\right)\left(d+e\,x^2\right)}+\frac{x^4\,(a+b\,\text{ArcSech}[c\,x])}{4\,d\left(d+e\,x^2\right)^2}-$$

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

Result (type 3, 486 leaves):

$$-\frac{1}{16 e^2}\left(-\frac{4 a d}{\left(d+e x^2\right)^2}+\frac{8 a}{d+e x^2}-\frac{2 e \sqrt{\frac{1-c x}{1+c x}}\,(b+b c x)}{\left(c^2 d+e\right)\left(d+e x^2\right)}+\frac{4 b\left(d+2 e x^2\right) \text{ArcSech}[c x]}{\left(d+e x^2\right)^2}+\right.$$

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

$$\text{Log}\left[\left(16 d e^{3/2} \sqrt{c^2 d+e}\left(\sqrt{e}-i c^2 \sqrt{d}\, x+\sqrt{c^2 d+e} \sqrt{\frac{1-c x}{1+c x}}+c \sqrt{c^2 d+e}\, x \sqrt{\frac{1-c x}{1+c x}}\right)\right)\right/$$

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

$$\text{Log}\left[\left(16 d e^{3/2} \sqrt{c^2 d+e}\left(\sqrt{e}+i c^2 \sqrt{d}\, x+\sqrt{c^2 d+e} \sqrt{\frac{1-c x}{1+c x}}+c \sqrt{c^2 d+e}\, x \sqrt{\frac{1-c x}{1+c x}}\right)\right)\right/$$

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

Problem 125: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x\,(a+b \text{ArcSech}[c x])}{\left(d+e x^2\right)^3}\, dx$$

Optimal (type 3, 217 leaves, 9 steps):

$$-\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{8 d\left(c^2 d+e\right)\left(d+e x^2\right)}-\frac{a+b \text{ArcSech}[c x]}{4 e\left(d+e x^2\right)^2}+$$

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

Result (type 3, 486 leaves):

$$\frac{1}{16}\left(-\frac{4 a}{e\left(d+e x^2\right)^2}-\frac{2\sqrt{\frac{1-c x}{1+c x}}\left(b+b c x\right)}{d\left(c^2 d+e\right)\left(d+e x^2\right)}-\frac{4 b \text{ArcSech}[c x]}{e\left(d+e x^2\right)^2}-\right.$$

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

$$\left(16 d^2\sqrt{e}\sqrt{c^2 d+e}\left(\sqrt{e}-\mathrm{i} c^2\sqrt{d} x+\sqrt{c^2 d+e}\sqrt{\frac{1-c x}{1+c x}}+c\sqrt{c^2 d+e} x\sqrt{\frac{1-c x}{1+c x}}\right)\right)\Big/$$

$$\left.\left.\left(b\left(3 c^2 d+2 e\right)\left(-\mathrm{i}\sqrt{d}+\sqrt{e} x\right)\right)\right]\right)\Big/\left(d^2\sqrt{e}\left(c^2 d+e\right)^{3/2}\right)-\left(b\left(3 c^2 d+2 e\right)\text{Log}\left[\right.\right.$$

$$\left(16 d^2\sqrt{e}\sqrt{c^2 d+e}\left(\sqrt{e}+\mathrm{i} c^2\sqrt{d} x+\sqrt{c^2 d+e}\sqrt{\frac{1-c x}{1+c x}}+c\sqrt{c^2 d+e} x\sqrt{\frac{1-c x}{1+c x}}\right)\right)\Big/$$

$$\left.\left.\left.\left(b\left(3 c^2 d+2 e\right)\left(\mathrm{i}\sqrt{d}+\sqrt{e} x\right)\right)\right]\right)\Big/\left(d^2\sqrt{e}\left(c^2 d+e\right)^{3/2}\right)\right)$$

Problem 126: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{a+b \text{ArcSech}[c x]}{x\left(d+e x^2\right)^3}\,dx$$

Optimal (type 4, 741 leaves, 30 steps):

$$-\frac{b\,e\left(c^2-\frac{1}{x^2}\right)}{8\,c\,d^2\left(c^2 d+e\right)\left(e+\frac{d}{x^2}\right)\sqrt{-1+\frac{1}{c\,x}}\,\sqrt{1+\frac{1}{c\,x}}\,x}+\frac{e^2\left(a+b\,\text{ArcSech}[c\,x]\right)}{4\,d^3\left(e+\frac{d}{x^2}\right)^2}-$$

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

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

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

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

$$\frac{b\,\text{PolyLog}\left[2,-\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{2\,d^3}-\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{2\,d^3}-$$

$$\frac{b\,\text{PolyLog}\left[2,-\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{2\,d^3}-\frac{b\,\text{PolyLog}\left[2,\frac{c\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{2\,d^3}$$

Result (type 4, 2054 leaves) :

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

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

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

$$\left(2 c^2 d+e\right) \text{Log}\left[-\left(\left(4 d \sqrt{e} \sqrt{c^2 d+e} \left(\sqrt{e}-\mathrm{i} c^2 \sqrt{d} x+\sqrt{c^2 d+e} \sqrt{\frac{1-c x}{1+c x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16 d^2}\sqrt{e} \left(\frac{\mathrm{i} \sqrt{e} \sqrt{\frac{1-c x}{1+c x}} (1+c x)}{\sqrt{d} \left(c^2 d+e\right) \left(\mathrm{i} \sqrt{d}+\sqrt{e}\, x\right)}-\frac{\text{ArcSech}[c x]}{\sqrt{e} \left(\mathrm{i} \sqrt{d}+\sqrt{e}\, x\right)^2}+\frac{\text{Log}[x]}{d \sqrt{e}}-\right.$$

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

$$\left(2 c^2 d+e\right) \text{Log}\left[-\left(\left(4 d \sqrt{e} \sqrt{c^2 d+e} \left(\sqrt{e}+\mathrm{i} c^2 \sqrt{d} x+\sqrt{c^2 d+e} \sqrt{\frac{1-c x}{1+c x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16 d^{5/2}}5 \mathrm{i} \sqrt{e} \left(-\frac{\text{ArcSech}[c x]}{\mathrm{i} \sqrt{d} \sqrt{e}+e x}+\frac{1}{\sqrt{d}}\mathrm{i} \left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x \sqrt{\frac{1-c x}{1+c x}}\right]}{\sqrt{e}}+\right.\right.$$

$$\left.\left.\frac{\text{Log}\left[\frac{2 \mathrm{i} \sqrt{e} \left(\sqrt{d} \sqrt{\frac{1-c x}{1+c x}} (1+c x)+\frac{\sqrt{d} \sqrt{e}+\mathrm{i} c^2 d x}{\sqrt{c^2 d+e}}\right)}{\mathrm{i} \sqrt{d}+\sqrt{e}\, x}\right]}{\sqrt{c^2 d+e}}\right)\right)+\frac{1}{16 d^{5/2}}5 \mathrm{i} \sqrt{e} \left(-\frac{\text{ArcSech}[c x]}{-\mathrm{i} \sqrt{d} \sqrt{e}+e x}-\frac{1}{\sqrt{d}}\right.$$

$$\left.\mathrm{i} \left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x \sqrt{\frac{1-c x}{1+c x}}\right]}{\sqrt{e}}+\frac{\text{Log}\left[\frac{2 \sqrt{e} \left(\mathrm{i} \sqrt{d} \sqrt{\frac{1-c x}{1+c x}} (1+c x)+\frac{\mathrm{i} \sqrt{d} \sqrt{e}+c^2 d x}{\sqrt{c^2 d+e}}\right)}{-\mathrm{i} \sqrt{d}+\sqrt{e}\, x}\right]}{\sqrt{c^2 d+e}}\right)\right)+$$

$$\frac{1}{2 d^3}\left(-\text{ArcSech}[c x]\left(\text{ArcSech}[c x]+2 \text{Log}\left[1+e^{-2 \text{ArcSech}[c x]}\right]\right)+\text{PolyLog}\left[2,-e^{-2 \text{ArcSech}[c x]}\right]\right)-$$

$$\frac{1}{4 d^3}\left(\text{PolyLog}\left[2,-e^{-2 \text{ArcSech}[c x]}\right]-\right.$$

$$2\left(-4 i \text{ArcSin}\left[\frac{\sqrt{1+\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{ArcTanh}\left[\frac{\left(i c \sqrt{d}+\sqrt{e}\right) \text{Tanh}\left[\frac{1}{2} \text{ArcSech}[c x]\right]}{\sqrt{c^2 d+e}}\right]+\text{ArcSech}[\right.$$

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

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

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

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

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

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

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

$$\left.\frac{\left(-i c \sqrt{d}+\sqrt{e}\right) \text{Tanh}\left[\frac{1}{2} \text{ArcSech}[c x]\right]}{\sqrt{c^2 d+e}}\right]+\text{ArcSech}[c x] \text{Log}\left[1+e^{-2 \text{ArcSech}[c x]}\right]-$$

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

$$2\,i\,\mathrm{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\mathrm{Log}\left[1+\frac{i\left(-\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]-$$

$$\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]-$$

$$2\,i\,\mathrm{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\mathrm{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\mathrm{PolyLog}\left[2,\right.$$

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

Problem 127: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4\left(a+b\,\mathrm{ArcSech}[c\,x]\right)}{\left(d+e\,x^2\right)^3}\,dx$$

Optimal (type 4, 1272 leaves, 35 steps):

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

$$\frac{\sqrt{-d}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{16\,e^{3/2}\,\left(\sqrt{-d}\,\sqrt{e}-\frac{d}{x}\right)^2}+\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{16\,e^2\,\left(\sqrt{-d}\,\sqrt{e}-\frac{d}{x}\right)}-\frac{\sqrt{-d}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{16\,e^{3/2}\,\left(\sqrt{-d}\,\sqrt{e}+\frac{d}{x}\right)^2}-$$

$$\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{16\,e^2\,\left(\sqrt{-d}\,\sqrt{e}+\frac{d}{x}\right)}-\frac{3\,b\,\text{ArcTan}\left[\frac{\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{1+\frac{1}{c\,x}}}{\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,\sqrt{-1+\frac{1}{c\,x}}}\right]}{8\,\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,e^2}-$$

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

$$\frac{b\,d\,\text{ArcTan}\left[\frac{\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,\sqrt{1+\frac{1}{c\,x}}}{\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{-1+\frac{1}{c\,x}}}\right]}{8\,\left(c\,d-\sqrt{-d}\,\sqrt{e}\right)^{3/2}\,\left(c\,d+\sqrt{-d}\,\sqrt{e}\right)^{3/2}\,e}+\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}-$$

$$\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1+\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}+\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}-$$

$$\frac{3\,\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1+\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}-\frac{3\,b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}+$$

$$\frac{3\,b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}-\frac{3\,b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}+\frac{3\,b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,\sqrt{-d}\,e^{5/2}}$$

Result (type 4, 2022 leaves):

$$\frac{a\,d\,x}{4\,e^2\,\left(d+e\,x^2\right)^2}-\frac{5\,a\,x}{8\,e^2\,\left(d+e\,x^2\right)}+\frac{3\,a\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{8\,\sqrt{d}\,e^{5/2}}+$$

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

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

$$\left(2\,c^2\,d+e\right)\,\text{Log}\left[-\left(\left(4\,d\,\sqrt{e}\,\sqrt{c^2\,d+e}\,\left(\sqrt{e}-\mathrm{i}\,c^2\,\sqrt{d}\,x+\sqrt{c^2\,d+e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16\,e^2}\mathrm{i}\,\sqrt{d}\,\left(\frac{\mathrm{i}\,\sqrt{e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)}{\sqrt{d}\,\left(c^2\,d+e\right)\,\left(\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)}-\frac{\text{ArcSech}[c\,x]}{\sqrt{e}\,\left(\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)^2}+\frac{\text{Log}[x]}{d\,\sqrt{e}}-\right.$$

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

$$\left(2\,c^2\,d+e\right)\,\text{Log}\left[-\left(\left(4\,d\,\sqrt{e}\,\sqrt{c^2\,d+e}\,\left(\sqrt{e}+\mathrm{i}\,c^2\,\sqrt{d}\,x+\sqrt{c^2\,d+e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16\,e^2}5\,\left(-\frac{\text{ArcSech}[c\,x]}{\mathrm{i}\,\sqrt{d}\,\sqrt{e}+e\,x}+\frac{1}{\sqrt{d}}\mathrm{i}\,\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c\,x}{1+c\,x}}+c\,x\,\sqrt{\frac{1-c\,x}{1+c\,x}}\right]}{\sqrt{e}}+\right.\right.$$

$$\left.\left.\frac{\text{Log}\left[\frac{2\,\mathrm{i}\,\sqrt{e}\,\left(\sqrt{d}\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)+\frac{\sqrt{d}\,\sqrt{e}+\mathrm{i}\,c^2\,d\,x}{\sqrt{c^2\,d+e}}\right)}{\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2\,d+e}}\right)\right)+\frac{1}{16\,e^2}5\,\left(-\frac{\text{ArcSech}[c\,x]}{-\mathrm{i}\,\sqrt{d}\,\sqrt{e}+e\,x}-\frac{1}{\sqrt{d}}\right.$$

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

$$\frac{1}{32\sqrt{d}\,e^{5/2}}3\,\mathbb{i}\left(\text{PolyLog}\left[2,-\mathbb{e}^{-2\,\text{ArcSech}[c\,x]}\right]-\right.$$

$$2\left(-4\,\mathbb{i}\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{\mathbb{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{\left(\mathbb{i}\,c\sqrt{d}+\sqrt{e}\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[c\,x]\right]}{\sqrt{c^2 d+e}}\right]+\text{ArcSech}[\right.$$

$$c\,x]\,\text{Log}\left[1+\mathbb{e}^{-2\,\text{ArcSech}[c\,x]}\right]-\text{ArcSech}[c\,x]\,\text{Log}\left[1+\frac{\mathbb{i}\left(\sqrt{e}-\sqrt{c^2 d+e}\right)\mathbb{e}^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+$$

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

$$\text{ArcSech}[c\,x]\,\text{Log}\left[1+\frac{\mathbb{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right)\mathbb{e}^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]-$$

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

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

$$\left.\left.\text{PolyLog}\left[2,-\frac{\mathbb{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right)\mathbb{e}^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\right)\right)-$$

$$\frac{1}{32\sqrt{d}\,e^{5/2}}3\,\mathbb{i}\left(-\text{PolyLog}\left[2,-\mathbb{e}^{-2\,\text{ArcSech}[c\,x]}\right]+2\left(-4\,\mathbb{i}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{\mathbb{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\right.\right.$$

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

$$\text{Log}\left[1 + e^{-2\, \text{ArcSech}[c\, x]}\right] - \text{ArcSech}[c\, x]\; \text{Log}\left[1 + \frac{i \left(-\sqrt{e} + \sqrt{c^2\, d + e}\right) e^{-\text{ArcSech}[c\, x]}}{c\, \sqrt{d}}\right] +$$

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

$$\text{ArcSech}[c\, x]\; \text{Log}\left[1 - \frac{i \left(\sqrt{e} + \sqrt{c^2\, d + e}\right) e^{-\text{ArcSech}[c\, x]}}{c\, \sqrt{d}}\right] -$$

$$2\, i\, \text{ArcSin}\left[\frac{\sqrt{1 - \frac{i\, \sqrt{e}}{c\, \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1 - \frac{i \left(\sqrt{e} + \sqrt{c^2\, d + e}\right) e^{-\text{ArcSech}[c\, x]}}{c\, \sqrt{d}}\right] + \text{PolyLog}\left[2,\right.$$

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

Problem 128: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 \left(a + b\, \text{ArcSech}[c\, x]\right)}{\left(d + e\, x^2\right)^3}\, dx$$

Optimal (type 4, 1276 leaves, 63 steps):

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

$$\frac{a+b\,\text{ArcSech}[c\,x]}{16\,\sqrt{-d}\,\sqrt{e}\,\left(\sqrt{-d}\,\sqrt{e}-\frac{d}{x}\right)^2}+\frac{a+b\,\text{ArcSech}[c\,x]}{16\,d\,e\,\left(\sqrt{-d}\,\sqrt{e}-\frac{d}{x}\right)}-\frac{a+b\,\text{ArcSech}[c\,x]}{16\,\sqrt{-d}\,\sqrt{e}\,\left(\sqrt{-d}\,\sqrt{e}+\frac{d}{x}\right)^2}-$$

$$\frac{a+b\,\text{ArcSech}[c\,x]}{16\,d\,e\,\left(\sqrt{-d}\,\sqrt{e}+\frac{d}{x}\right)}+\frac{b\,\text{ArcTan}\left[\frac{\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{1+\frac{1}{c\,x}}}{\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,\sqrt{-1+\frac{1}{c\,x}}}\right]}{8\,\left(c\,d-\sqrt{-d}\,\sqrt{e}\right)^{3/2}\,\left(c\,d+\sqrt{-d}\,\sqrt{e}\right)^{3/2}}-$$

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

$$\frac{b\,\text{ArcTan}\left[\frac{\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,\sqrt{1+\frac{1}{c\,x}}}{\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{-1+\frac{1}{c\,x}}}\right]}{8\,d\,\sqrt{c\,d-\sqrt{-d}\,\sqrt{e}}\,\sqrt{c\,d+\sqrt{-d}\,\sqrt{e}}\,e}-\frac{\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}+$$

$$\frac{\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1+\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}-\frac{\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}+$$

$$\frac{\left(a+b\,\text{ArcSech}[c\,x]\right)\,\text{Log}\left[1+\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}+\frac{b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}-$$

$$\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}-\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}+\frac{b\,\text{PolyLog}\left[2,-\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}-\frac{b\,\text{PolyLog}\left[2,\frac{c\,\sqrt{-d}\,e^{\text{ArcSech}[c\,x]}}{\sqrt{e}+\sqrt{c^2\,d+e}}\right]}{16\,(-d)^{3/2}\,e^{3/2}}$$

Result (type 4, 2030 leaves):

$$-\frac{a\,x}{4\,e\,\left(d+e\,x^2\right)^2}+\frac{a\,x}{8\,d\,e\,\left(d+e\,x^2\right)}+\frac{a\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{8\,d^{3/2}\,e^{3/2}}+$$

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

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

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

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

$$\frac{1}{16\sqrt{d}\,e}i\left(\frac{i\sqrt{e}\sqrt{\frac{1-c\,x}{1+c\,x}}\left(1+c\,x\right)}{\sqrt{d}\left(c^2d+e\right)\left(i\sqrt{d}+\sqrt{e}\,x\right)}-\frac{\text{ArcSech}[c\,x]}{\sqrt{e}\left(i\sqrt{d}+\sqrt{e}\,x\right)^2}+\frac{\text{Log}[x]}{d\sqrt{e}}-\right.$$

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

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

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

$$\frac{1}{16\,d\,e}\left(-\frac{\text{ArcSech}[c\,x]}{i\sqrt{d}\sqrt{e}+e\,x}+\frac{1}{\sqrt{d}}i\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c\,x}{1+c\,x}}+c\,x\sqrt{\frac{1-c\,x}{1+c\,x}}\right]}{\sqrt{e}}+\right.\right.$$

$$\left.\left.\frac{\text{Log}\left[\frac{2\,i\sqrt{e}\left(\sqrt{d}\sqrt{\frac{1-c\,x}{1+c\,x}}\left(1+c\,x\right)+\frac{\sqrt{d}\sqrt{e}+i\,c^2\,d\,x}{\sqrt{c^2d+e}}\right)}{i\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2d+e}}\right)\right)-\frac{1}{16\,d\,e}\left(-\frac{\text{ArcSech}[c\,x]}{-i\sqrt{d}\sqrt{e}+e\,x}-\frac{1}{\sqrt{d}}\right.$$

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

$$\frac{1}{32\,d^{3/2}\,e^{3/2}}\,i\,\Bigg(\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c\,x]}\right]-$$

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

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

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

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

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

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

$$\left.\text{PolyLog}\left[2,-\frac{i\left(\sqrt{e}+\sqrt{c^2\,d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]\right)\Bigg)-$$

$$\frac{1}{32\,d^{3/2}\,e^{3/2}}\,i\,\Bigg(-\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c\,x]}\right]+2\left(-4\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\right.$$

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

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

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

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

$$2\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{i\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\text{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

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

Problem 129: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{\left(d+e\,x^2\right)^3}\,dx$$

Optimal (type 4, 1272 leaves, 81 steps):

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

$$\frac{\sqrt{e} (a+b \text{ArcSech}[c x])}{16 (-d)^{3/2} \left(\sqrt{-d} \sqrt{e}-\frac{d}{x}\right)^2}-\frac{5 (a+b \text{ArcSech}[c x])}{16 d^2 \left(\sqrt{-d} \sqrt{e}-\frac{d}{x}\right)}-\frac{\sqrt{e} (a+b \text{ArcSech}[c x])}{16 (-d)^{3/2} \left(\sqrt{-d} \sqrt{e}+\frac{d}{x}\right)^2}+$$

$$\frac{5 (a+b \text{ArcSech}[c x])}{16 d^2 \left(\sqrt{-d} \sqrt{e}+\frac{d}{x}\right)}+\frac{5 b \text{ArcTan}\left[\frac{\sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{1+\frac{1}{c x}}}{\sqrt{c d+\sqrt{-d} \sqrt{e}} \sqrt{-1+\frac{1}{c x}}}\right]}{8 d^2 \sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{c d+\sqrt{-d} \sqrt{e}}}-$$

$$\frac{b e \text{ArcTan}\left[\frac{\sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{1+\frac{1}{c x}}}{\sqrt{c d+\sqrt{-d} \sqrt{e}} \sqrt{-1+\frac{1}{c x}}}\right]}{8 d \left(c d-\sqrt{-d} \sqrt{e}\right)^{3/2} \left(c d+\sqrt{-d} \sqrt{e}\right)^{3/2}}+\frac{5 b \text{ArcTan}\left[\frac{\sqrt{c d+\sqrt{-d} \sqrt{e}} \sqrt{1+\frac{1}{c x}}}{\sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{-1+\frac{1}{c x}}}\right]}{8 d^2 \sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{c d+\sqrt{-d} \sqrt{e}}}-$$

$$\frac{b e \text{ArcTan}\left[\frac{\sqrt{c d+\sqrt{-d} \sqrt{e}} \sqrt{1+\frac{1}{c x}}}{\sqrt{c d-\sqrt{-d} \sqrt{e}} \sqrt{-1+\frac{1}{c x}}}\right]}{8 d \left(c d-\sqrt{-d} \sqrt{e}\right)^{3/2} \left(c d+\sqrt{-d} \sqrt{e}\right)^{3/2}}+\frac{3 (a+b \text{ArcSech}[c x]) \text{Log}\left[1-\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}-$$

$$\frac{3 (a+b \text{ArcSech}[c x]) \text{Log}\left[1+\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}+\frac{3 (a+b \text{ArcSech}[c x]) \text{Log}\left[1-\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}-$$

$$\frac{3 (a+b \text{ArcSech}[c x]) \text{Log}\left[1+\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}-\frac{3 b \text{PolyLog}\left[2,-\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}+$$

$$\frac{3 b \text{PolyLog}\left[2,\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}-\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}-\frac{3 b \text{PolyLog}\left[2,-\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}+\frac{3 b \text{PolyLog}\left[2,\frac{c \sqrt{-d} e^{\text{ArcSech}[c x]}}{\sqrt{e}+\sqrt{c^2 d+e}}\right]}{16 (-d)^{5/2} \sqrt{e}}$$

Result (type 4, 2015 leaves):

$$\frac{a x}{4 d (d+e x^2)^2}+\frac{3 a x}{8 d^2 (d+e x^2)}+\frac{3 a \text{ArcTan}\left[\frac{\sqrt{e} x}{\sqrt{d}}\right]}{8 d^{5/2} \sqrt{e}}+$$

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

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

$$\left(2\,c^2 d+e\right)\,\text{Log}\left[-\left(\left(4\,d\sqrt{e}\,\sqrt{c^2 d+e}\,\left(\sqrt{e}-\mathbb{i}\,c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16\,d^{3/2}}\mathbb{i}\left(\frac{\mathbb{i}\,\sqrt{e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)}{\sqrt{d}\,\left(c^2 d+e\right)\,\left(\mathbb{i}\,\sqrt{d}+\sqrt{e}\,x\right)} - \frac{\text{ArcSech}[c\,x]}{\sqrt{e}\,\left(\mathbb{i}\,\sqrt{d}+\sqrt{e}\,x\right)^2} + \frac{\text{Log}[x]}{d\sqrt{e}} - \right.$$

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

$$\left(2\,c^2 d+e\right)\,\text{Log}\left[-\left(\left(4\,d\sqrt{e}\,\sqrt{c^2 d+e}\,\left(\sqrt{e}+\mathbb{i}\,c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\,\sqrt{\frac{1-c\,x}{1+c\,x}}+\right.\right.\right.\right.$$

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

$$\frac{1}{16\,d^2}3\left(-\frac{\text{ArcSech}[c\,x]}{\mathbb{i}\,\sqrt{d}\,\sqrt{e}+e\,x} + \frac{1}{\sqrt{d}}\mathbb{i}\left(\frac{\text{Log}[x]}{\sqrt{e}} - \frac{\text{Log}\left[1+\sqrt{\frac{1-c\,x}{1+c\,x}}+c\,x\sqrt{\frac{1-c\,x}{1+c\,x}}\right]}{\sqrt{e}} + \right.\right.$$

$$\left.\left.\frac{\text{Log}\left[\frac{2\,\mathbb{i}\,\sqrt{e}\,\left(\sqrt{d}\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)+\frac{\sqrt{d}\,\sqrt{e}+\mathbb{i}\,c^2 d\,x}{\sqrt{c^2 d+e}}\right)}{\mathbb{i}\,\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2 d+e}}\right)\right) - \frac{1}{16\,d^2}3\left(-\frac{\text{ArcSech}[c\,x]}{-\mathbb{i}\,\sqrt{d}\,\sqrt{e}+e\,x} - \frac{1}{\sqrt{d}}\right.$$

$$\mathrm{i}\left(\frac{\mathrm{Log}[x]}{\sqrt{e}}-\frac{\mathrm{Log}\left[1+\sqrt{\frac{1-c\,x}{1+c\,x}}+c\,x\sqrt{\frac{1-c\,x}{1+c\,x}}\right]}{\sqrt{e}}+\frac{\mathrm{Log}\left[\frac{2\sqrt{e}\left(\mathrm{i}\sqrt{d}\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)+\frac{\mathrm{i}\sqrt{d}\sqrt{e}+c^2 d\,x}{\sqrt{c^2 d+e}}\right)}{-\mathrm{i}\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2 d+e}}\right)\Bigg)-$$

$$\frac{1}{32\,d^{5/2}\sqrt{e}}\,3\,\mathrm{i}\left(\mathrm{PolyLog}\left[2,-e^{-2\,\mathrm{ArcSech}[c\,x]}\right]-\right.$$

$$2\left(-4\,\mathrm{i}\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{\mathrm{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\mathrm{ArcTanh}\left[\frac{\left(\mathrm{i}\,c\sqrt{d}+\sqrt{e}\right)\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSech}[c\,x]\right]}{\sqrt{c^2 d+e}}\right]+\mathrm{ArcSech}[\right.$$

$$c\,x]\,\mathrm{Log}\left[1+e^{-2\,\mathrm{ArcSech}[c\,x]}\right]-\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\left[1+\frac{\mathrm{i}\left(\sqrt{e}-\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+$$

$$2\,\mathrm{i}\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{\mathrm{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\mathrm{Log}\left[1+\frac{\mathrm{i}\left(\sqrt{e}-\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]-$$

$$\mathrm{ArcSech}[c\,x]\,\mathrm{Log}\left[1+\frac{\mathrm{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]-$$

$$2\,\mathrm{i}\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{\mathrm{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\mathrm{Log}\left[1+\frac{\mathrm{i}\left(\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+$$

$$\mathrm{PolyLog}\left[2,\frac{\mathrm{i}\left(-\sqrt{e}+\sqrt{c^2 d+e}\right)e^{-\mathrm{ArcSech}[c\,x]}}{c\sqrt{d}}\right]+$$

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

$$\frac{1}{32\,d^{5/2}\sqrt{e}}\,3\,\mathrm{i}\left(-\mathrm{PolyLog}\left[2,-e^{-2\,\mathrm{ArcSech}[c\,x]}\right]+2\left(-4\,\mathrm{i}\,\mathrm{ArcSin}\left[\frac{\sqrt{1-\frac{\mathrm{i}\sqrt{e}}{c\sqrt{d}}}}{\sqrt{2}}\right]\right.\right.$$

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

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

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

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

$$2 i \text{ArcSin}\left[\frac{\sqrt{1-\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \text{Log}\left[1-\frac{i \left(\sqrt{e}+\sqrt{c^2 d+e}\right) e^{-\text{ArcSech}[c x]}}{c \sqrt{d}}\right]+\text{PolyLog}\Big[2,$$

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

Problem 130: Result unnecessarily involves imaginary or complex numbers.

$$\int x^5 \sqrt{d+e x^2} \left(a+b \text{ArcSech}[c x]\right) dx$$

Optimal (type 3, 447 leaves, 12 steps):

$$\frac{b\left(23 c^4 d^2+12 c^2 d e-75 e^2\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\sqrt{d+e x^2}}{1680 c^6 e^2}+$$

$$\frac{b\left(29 c^2 d-25 e\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{840 c^4 e^2}-$$

$$\frac{b\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\left(d+e x^2\right)^{5/2}}{42 c^2 e^2}+\frac{d^2\left(d+e x^2\right)^{3/2}\left(a+b \text{ArcSech}[c x]\right)}{3 e^3}-$$

$$\frac{2 d\left(d+e x^2\right)^{5/2}\left(a+b \text{ArcSech}[c x]\right)}{5 e^3}+\frac{\left(d+e x^2\right)^{7/2}\left(a+b \text{ArcSech}[c x]\right)}{7 e^3}-\frac{1}{1680 c^7 e^{5/2}}$$

$$b\left(105 c^6 d^3-35 c^4 d^2 e+63 c^2 d e^2+75 e^3\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\,\text{ArcTan}\left[\frac{\sqrt{e}\sqrt{1-c^2 x^2}}{c\sqrt{d+e x^2}}\right]-$$

$$\frac{8 b d^{7/2}\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d}\sqrt{1-c^2 x^2}}\right]}{105 e^3}$$

Result (type 3, 396 leaves):

$$\frac{1}{1680 c^6 e^3}\sqrt{d+e x^2}\left(16 a c^6\left(8 d^3-4 d^2 e x^2+3 d e^2 x^4+15 e^3 x^6\right)-\right.$$

$$b e\sqrt{\frac{1-c x}{1+c x}}\left(1+c x\right)\left(75 e^2+2 c^2 e\left(19 d+25 e x^2\right)+c^4\left(-41 d^2+22 d e x^2+40 e^2 x^4\right)\right)+$$

$$\left.16 b c^6\left(8 d^3-4 d^2 e x^2+3 d e^2 x^4+15 e^3 x^6\right)\text{ArcSech}[c x]\right)-\left(b\sqrt{\frac{1-c x}{1+c x}}\sqrt{-1+c^2 x^2}\right.$$

$$\left(-128\, i\, c^7 d^{7/2}\text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}}{128 c^6 d^{9/2} x^2}\right]+\right.$$

$$\sqrt{e}\left(105 c^6 d^3-35 c^4 d^2 e+63 c^2 d e^2+75 e^3\right)$$

$$\left.\left.\text{Log}\left[-e+2 c\sqrt{e}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)\right)\Big/\left(3360 c^7 e^3\left(-1+c x\right)\right)$$

Problem 131: Result unnecessarily involves imaginary or complex numbers.

$$\int x^3\sqrt{d+e x^2}\left(a+b \text{ArcSech}[c x]\right)dx$$

Optimal (type 3, 329 leaves, 11 steps):

$$-\frac{b\left(c^2 d+9 e\right)\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\sqrt{d+e x^2}}{120 c^4 e}-\frac{b\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\left(d+e x^2\right)^{3/2}}{20 c^2 e}-\frac{d\left(d+e x^2\right)^{3/2}\left(a+b\,\text{ArcSech}[c x]\right)}{3 e^2}+\frac{\left(d+e x^2\right)^{5/2}\left(a+b\,\text{ArcSech}[c x]\right)}{5 e^2}+\frac{b\left(15 c^4 d^2-10 c^2 d e-9 e^2\right)\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\text{ArcTan}\left[\frac{\sqrt{e}\,\sqrt{1-c^2 x^2}}{c\sqrt{d+e x^2}}\right]}{120 c^5 e^{3/2}}+\frac{2 b d^{5/2}\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d}\,\sqrt{1-c^2 x^2}}\right]}{15 e^2}$$

Result (type 3, 333 leaves):

$$-\frac{1}{120 c^4 e^2}\sqrt{d+e x^2}\left(8 a c^4\left(2 d^2-d e x^2-3 e^2 x^4\right)+b e\sqrt{\frac{1-c x}{1+c x}}\,(1+c x)\left(9 e+c^2\left(7 d+6 e x^2\right)\right)+8 b c^4\left(2 d^2-d e x^2-3 e^2 x^4\right)\text{ArcSech}[c x]\right)-\left(b\sqrt{\frac{1-c x}{1+c x}}\,\sqrt{-1+c^2 x^2}\left(16\, i\, c^5 d^{5/2}\,\text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\,\sqrt{-1+c^2 x^2}\,\sqrt{d+e x^2}}{16 c^4 d^{7/2} x^2}\right]+\sqrt{e}\left(-15 c^4 d^2+10 c^2 d e+9 e^2\right)\text{Log}\left[-e+2 c\sqrt{e}\,\sqrt{-1+c^2 x^2}\,\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)\right)\Big/\left(240 c^5 e^2(-1+c x)\right)$$

Problem 132: Result unnecessarily involves imaginary or complex numbers.

$$\int x\sqrt{d+e x^2}\,\left(a+b\,\text{ArcSech}[c x]\right)\,dx$$

Optimal (type 3, 221 leaves, 10 steps):

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

Result (type 3, 275 leaves):

$$\frac{1}{6 c^2 e}\sqrt{d+e x^2}\left(-b e \sqrt{\frac{1-c x}{1+c x}}\,(1+c x)+2 a c^2\left(d+e x^2\right)+2 b c^2\left(d+e x^2\right) \text{ArcSech}[c x]\right)-$$

$$\frac{1}{12 c^3 e(-1+c x)}$$

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

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

Problem 138: Unable to integrate problem.

$$\int \frac{\sqrt{d+e x^2}\,(a+b \text{ArcSech}[c x])}{x^4}\,dx$$

Optimal (type 4, 312 leaves, 9 steps):

$$\frac{b \sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\sqrt{d+e x^2}}{9 x^3}+\frac{2 b\left(c^2 d+2 e\right) \sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\sqrt{d+e x^2}}{9 d x}-$$

$$\frac{\left(d+e x^2\right)^{3/2}(a+b \text{ArcSech}[c x])}{3 d x^3}+\frac{1}{9 d \sqrt{1+\frac{e x^2}{d}}}$$

$$2 b c\left(c^2 d+2 e\right) \sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{d+e x^2}\,\text{EllipticE}\left[\text{ArcSin}[c x],-\frac{e}{c^2 d}\right]-\frac{1}{9 c d \sqrt{d+e x^2}}$$

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

Result (type 8, 25 leaves):

$$\int \frac{\sqrt{d+e x^2}\,(a+b \text{ArcSech}[c x])}{x^4}\,dx$$

Problem 139: Unable to integrate problem.

$$\int \frac{\sqrt{d+e x^2}\,(a+b \text{ArcSech}[c x])}{x^6}\,dx$$

Optimal (type 4, 446 leaves, 10 steps):

$$\frac{b\left(12 c^2 d-e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{225 d x^3}+$$

$$\frac{b\left(24 c^4 d^2+19 c^2 d e-31 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{225 d^2 x}+$$

$$\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \left(d+e x^2\right)^{3/2}}{25 d x^5}-\frac{\left(d+e x^2\right)^{3/2} (a+b \operatorname{ArcSech}[c x])}{5 d x^5}+$$

$$\frac{2 e \left(d+e x^2\right)^{3/2} (a+b \operatorname{ArcSech}[c x])}{15 d^2 x^3}+\frac{1}{225 d^2 \sqrt{1+\frac{e x^2}{d}}}$$

$$b c \left(24 c^4 d^2+19 c^2 d e-31 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{d+e x^2} \operatorname{EllipticE}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]-$$

$$\left(b\left(c^2 d+e\right)\left(24 c^4 d^2+7 c^2 d e-30 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\right.$$

$$\left.\sqrt{1+\frac{e x^2}{d}} \operatorname{EllipticF}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]\right) \Big/ \left(225 c d^2 \sqrt{d+e x^2}\right)$$

Result (type 8, 25 leaves):

$$\int \frac{\sqrt{d+e x^2} (a+b \operatorname{ArcSech}[c x])}{x^6} \, dx$$

Problem 140: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 418 leaves, 12 steps):

$$\frac{b\left(3 c^4 d^2-38 c^2 d e-25 e^2\right)\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\sqrt{d+e x^2}}{560 c^6 e}-$$

$$\frac{b\left(13 c^2 d+25 e\right)\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\left(d+e x^2\right)^{3/2}}{840 c^4 e}-$$

$$\frac{b\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\sqrt{1-c^2 x^2}\,\left(d+e x^2\right)^{5/2}}{42 c^2 e}-\frac{d\left(d+e x^2\right)^{5/2}\left(a+b\,\text{ArcSech}[c x]\right)}{5 e^2}+$$

$$\frac{\left(d+e x^2\right)^{7/2}\left(a+b\,\text{ArcSech}[c x]\right)}{7 e^2}+\frac{1}{560 c^7 e^{3/2}}$$

$$b\left(35 c^6 d^3-35 c^4 d^2 e-63 c^2 d e^2-25 e^3\right)\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\text{ArcTan}\left[\frac{\sqrt{e}\,\sqrt{1-c^2 x^2}}{c\sqrt{d+e x^2}}\right]+$$

$$\frac{2 b d^{7/2}\sqrt{\frac{1}{1+c x}}\,\sqrt{1+c x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d}\,\sqrt{1-c^2 x^2}}\right]}{35 e^2}$$

Result (type 3, 369 leaves):

$$-\frac{1}{1680 c^6 e^2}\sqrt{d+e x^2}\left(48 a c^6\left(2 d-5 e x^2\right)\left(d+e x^2\right)^2+\right.$$

$$b e\sqrt{\frac{1-c x}{1+c x}}\left(1+c x\right)\left(75 e^2+2 c^2 e\left(82 d+25 e x^2\right)+c^4\left(57 d^2+106 d e x^2+40 e^2 x^4\right)\right)+$$

$$\left.48 b c^6\left(2 d-5 e x^2\right)\left(d+e x^2\right)^2\text{ArcSech}[c x]\right)-$$

$$\left(b\sqrt{\frac{1-c x}{1+c x}}\sqrt{-1+c^2 x^2}\left(32\, i\, c^7 d^{7/2}\,\text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}}{32 c^6 d^{9/2} x^2}\right]+\right.\right.$$

$$\sqrt{e}\left(-35 c^6 d^3+35 c^4 d^2 e+63 c^2 d e^2+25 e^3\right)$$

$$\left.\left.\text{Log}\left[-e+2 c\sqrt{e}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)\right)\Big/\left(1120 c^7 e^2\left(-1+c x\right)\right)$$

Problem 141: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 297 leaves, 11 steps):

$$-\frac{b\left(7c^2 d+3e\right)\sqrt{\frac{1}{1+cx}}\sqrt{1+cx}\sqrt{1-c^2x^2}\sqrt{d+ex^2}}{40c^4}-$$

$$\frac{b\sqrt{\frac{1}{1+cx}}\sqrt{1+cx}\sqrt{1-c^2x^2}\left(d+ex^2\right)^{3/2}}{20c^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\,\text{ArcSech}[cx]\right)}{5e}-$$

$$\frac{b\left(15c^4d^2+10c^2de+3e^2\right)\sqrt{\frac{1}{1+cx}}\sqrt{1+cx}\,\text{ArcTan}\left[\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right]}{40c^5\sqrt{e}}-$$

$$\frac{b\,d^{5/2}\sqrt{\frac{1}{1+cx}}\sqrt{1+cx}\,\text{ArcTanh}\left[\frac{\sqrt{d+ex^2}}{\sqrt{d}\sqrt{1-c^2x^2}}\right]}{5e}$$

Result (type 3, 313 leaves):

$$\frac{1}{40c^4e}\sqrt{d+ex^2}$$

$$\left(8ac^4\left(d+ex^2\right)^2-be\sqrt{\frac{1-cx}{1+cx}}\left(1+cx\right)\left(3e+c^2\left(9d+2ex^2\right)\right)+8bc^4\left(d+ex^2\right)^2\text{ArcSech}[cx]\right)+$$

$$\frac{1}{80c^5e\left(-1+cx\right)}\text{i}\,b\sqrt{\frac{1-cx}{1+cx}}\sqrt{-1+c^2x^2}$$

$$\left(8c^5d^{5/2}\,\text{Log}\left[\frac{-\text{i}\,ex^2+\text{i}\,d\left(-2+c^2x^2\right)+2\sqrt{d}\sqrt{-1+c^2x^2}\sqrt{d+ex^2}}{8c^4d^{7/2}x^2}\right]+\right.$$

$$\left.\text{i}\sqrt{e}\left(15c^4d^2+10c^2de+3e^2\right)\text{Log}\left[-e+2c\sqrt{e}\sqrt{-1+c^2x^2}\sqrt{d+ex^2}+c^2\left(d+2ex^2\right)\right]\right)$$

Problem 148: Unable to integrate problem.

$$\int\frac{\left(d+ex^2\right)^{3/2}\left(a+b\,\text{ArcSech}[cx]\right)}{x^6}\,dx$$

Optimal (type 4, 409 leaves, 10 steps):

$$\frac{4\,b\,\left(c^2\,d+2\,e\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\sqrt{d+e\,x^2}}{75\,x^3}+$$

$$\frac{b\,\left(8\,c^4\,d^2+23\,c^2\,d\,e+23\,e^2\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\sqrt{d+e\,x^2}}{75\,d\,x}+$$

$$\frac{b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\left(d+e\,x^2\right)^{3/2}}{25\,x^5}-\frac{\left(d+e\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{5\,d\,x^5}+\frac{1}{75\,d\,\sqrt{1+\frac{e\,x^2}{d}}}$$

$$b\,c\,\left(8\,c^4\,d^2+23\,c^2\,d\,e+23\,e^2\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{d+e\,x^2}\,\text{EllipticE}\left[\text{ArcSin}[c\,x],-\frac{e}{c^2\,d}\right]-$$

$$\frac{1}{75\,c\,d\,\sqrt{d+e\,x^2}}b\,\left(c^2\,d+e\right)\,\left(8\,c^4\,d^2+19\,c^2\,d\,e+15\,e^2\right)$$

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

Result (type 8, 25 leaves) :

$$\int\frac{\left(d+e\,x^2\right)^{3/2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x^6}\,dx$$

Problem 149: Unable to integrate problem.

$$\int\frac{\left(d+e\,x^2\right)^{3/2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{x^8}\,dx$$

Optimal (type 4, 556 leaves, 11 steps) :

$$\frac{b\left(120 c^4 d^2+159 c^2 d e-37 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{3675 d x^3}+\frac{1}{3675 d^2 x}$$

$$b\left(240 c^6 d^3+528 c^4 d^2 e+193 c^2 d e^2-247 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}+$$

$$\frac{b\left(30 c^2 d+11 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{1225 d x^5}+$$

$$\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{5/2}}{49 d x^7}-\frac{\left(d+e x^2\right)^{5/2}(a+b \text{ArcSech}[c x])}{7 d x^7}+$$

$$\frac{2 e\left(d+e x^2\right)^{5/2}(a+b \text{ArcSech}[c x])}{35 d^2 x^5}+\left(b c\left(240 c^6 d^3+528 c^4 d^2 e+193 c^2 d e^2-247 e^3\right)\right.$$

$$\left.\sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{d+e x^2} \text{EllipticE}\left[\text{ArcSin}[c x],-\frac{e}{c^2 d}\right]\right) \Big/ \left(3675 d^2 \sqrt{1+\frac{e x^2}{d}}\right)-$$

$$\left(2 b\left(c^2 d+e\right)\left(120 c^6 d^3+204 c^4 d^2 e+17 c^2 d e^2-105 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x}\right.$$

$$\left.\sqrt{1+\frac{e x^2}{d}} \text{EllipticF}\left[\text{ArcSin}[c x],-\frac{e}{c^2 d}\right]\right) \Big/ \left(3675 c d^2 \sqrt{d+e x^2}\right)$$

Result (type 8, 25 leaves):

$$\int \frac{\left(d+e x^2\right)^{3/2}(a+b \text{ArcSech}[c x])}{x^8} \, dx$$

Problem 150: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^5(a+b \text{ArcSech}[c x])}{\sqrt{d+e x^2}} \, dx$$

Optimal (type 3, 356 leaves, 11 steps):

$$\frac{b\left(19 c^2 d-9 e\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\sqrt{d+e x^2}}{120 c^4 e^2}-$$

$$\frac{b\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{20 c^2 e^2}+\frac{d^2\sqrt{d+e x^2}\left(a+b\,\text{ArcSech}[c x]\right)}{e^3}-$$

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

$$\frac{b\left(45 c^4 d^2-10 c^2 d e+9 e^2\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\,\text{ArcTan}\left[\frac{\sqrt{e}\sqrt{1-c^2 x^2}}{c\sqrt{d+e x^2}}\right]}{120 c^5 e^{5/2}}-$$

$$\frac{8 b d^{5/2}\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d}\sqrt{1-c^2 x^2}}\right]}{15 e^3}$$

Result (type 3, 334 leaves):

$$\frac{1}{120 c^4 e^3}\sqrt{d+e x^2}\left(8 a c^4\left(8 d^2-4 d e x^2+3 e^2 x^4\right)-b e\sqrt{\frac{1-c x}{1+c x}}\left(1+c x\right)\left(9 e+c^2\left(-13 d+6 e x^2\right)\right)+\right.$$
$$\left.8 b c^4\left(8 d^2-4 d e x^2+3 e^2 x^4\right)\text{ArcSech}[c x]\right)-\left(b\sqrt{\frac{1-c x}{1+c x}}\sqrt{-1+c^2 x^2}\right.$$
$$\left(-64 i c^5 d^{5/2}\,\text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}}{64 c^4 d^{7/2} x^2}\right]+\right.$$
$$\sqrt{e}\left(45 c^4 d^2-10 c^2 d e+9 e^2\right)$$
$$\left.\left.\text{Log}\left[-e+2 c\sqrt{e}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)\right)\Big/\left(240 c^5 e^3\left(-1+c x\right)\right)$$

Problem 151: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 251 leaves, 10 steps):

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

Result (type 3, 280 leaves):

$$-\frac{1}{6\,c^2\,e^2}\sqrt{d+e\,x^2}\,\left(b\,e\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)+2\,a\,c^2\,\left(2\,d-e\,x^2\right)+2\,b\,c^2\,\left(2\,d-e\,x^2\right)\,\text{ArcSech}[c\,x]\right)-\left(b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\sqrt{-1+c^2\,x^2}\,\left(4\,i\,c^3\,d^{3/2}\,\text{Log}\left[\frac{-i\,e\,x^2+i\,d\,\left(-2+c^2\,x^2\right)+2\,\sqrt{d}\,\sqrt{-1+c^2\,x^2}\,\sqrt{d+e\,x^2}}{4\,c^2\,d^{5/2}\,x^2}\right]+\sqrt{e}\,\left(-3\,c^2\,d+e\right)\,\text{Log}\left[-e+2\,c\,\sqrt{e}\,\sqrt{-1+c^2\,x^2}\,\sqrt{d+e\,x^2}+c^2\,\left(d+2\,e\,x^2\right)\right]\right)\right)\Big/\left(12\,c^3\,e^2\,\left(-1+c\,x\right)\right)$$

Problem 152: Unable to integrate problem.

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

Optimal (type 3, 153 leaves, 10 steps):

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

Result (type 8, 23 leaves):

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

Problem 157: Unable to integrate problem.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^2\sqrt{d+e\,x^2}}\,dx$$

Optimal (type 4, 221 leaves, 9 steps):

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

Result (type 8, 25 leaves):

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^2\sqrt{d+e\,x^2}}\,dx$$

Problem 158: Unable to integrate problem.

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^4\sqrt{d+e\,x^2}}\,dx$$

Optimal (type 4, 346 leaves, 9 steps):

$$\frac{b\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\sqrt{d+e\,x^2}}{9\,d\,x^3}+\frac{b\left(2\,c^2\,d-5\,e\right)\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\sqrt{d+e\,x^2}}{9\,d^2\,x}-\frac{\sqrt{d+e\,x^2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{3\,d\,x^3}+\frac{2\,e\,\sqrt{d+e\,x^2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{3\,d^2\,x}+\frac{1}{9\,d^2\,\sqrt{1+\frac{e\,x^2}{d}}}b\,c\left(2\,c^2\,d-5\,e\right)\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{d+e\,x^2}\,\text{EllipticE}\left[\text{ArcSin}[c\,x],-\frac{e}{c^2\,d}\right]-\frac{1}{9\,c\,d^2\,\sqrt{d+e\,x^2}}2\,b\left(c^2\,d-3\,e\right)\left(c^2\,d+e\right)\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1+\frac{e\,x^2}{d}}\,\text{EllipticF}\left[\text{ArcSin}[c\,x],-\frac{e}{c^2\,d}\right]$$

Result (type 8, 25 leaves):

$$\int \frac{a+b\,\text{ArcSech}[c\,x]}{x^4\sqrt{d+e\,x^2}}\,dx$$

Problem 159: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 278 leaves, 10 steps):

$$-\frac{b\sqrt{\frac{1}{1+c\,x}}\sqrt{1+c\,x}\sqrt{1-c^2x^2}\sqrt{d+e\,x^2}}{6\,c^2e^2}-\frac{d^2\left(a+b\,\text{ArcSech}[c\,x]\right)}{e^3\sqrt{d+e\,x^2}}-\frac{2\,d\sqrt{d+e\,x^2}\left(a+b\,\text{ArcSech}[c\,x]\right)}{e^3}+\frac{\left(d+e\,x^2\right)^{3/2}\left(a+b\,\text{ArcSech}[c\,x]\right)}{3\,e^3}+\frac{b\left(9\,c^2d-e\right)\sqrt{\frac{1}{1+c\,x}}\sqrt{1+c\,x}\,\text{ArcTan}\left[\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+e\,x^2}}\right]}{6\,c^3e^{5/2}}+\frac{8\,b\,d^{3/2}\sqrt{\frac{1}{1+c\,x}}\sqrt{1+c\,x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x^2}}{\sqrt{d}\sqrt{1-c^2x^2}}\right]}{3\,e^3}$$

Result (type 3, 310 leaves):

$$\frac{1}{6\,c^2e^3\sqrt{d+e\,x^2}}\left(-b\,e\sqrt{\frac{1-c\,x}{1+c\,x}}\left(1+c\,x\right)\left(d+e\,x^2\right)-2\,a\,c^2\left(8\,d^2+4\,d\,e\,x^2-e^2x^4\right)-2\,b\,c^2\left(8\,d^2+4\,d\,e\,x^2-e^2x^4\right)\text{ArcSech}[c\,x]\right)-\left(b\sqrt{\frac{1-c\,x}{1+c\,x}}\sqrt{-1+c^2x^2}\left(16\,i\,c^3d^{3/2}\,\text{Log}\left[\frac{-i\,e\,x^2+i\,d\left(-2+c^2x^2\right)+2\sqrt{d}\sqrt{-1+c^2x^2}\sqrt{d+e\,x^2}}{16\,c^2d^{5/2}x^2}\right]+\sqrt{e}\left(-9\,c^2d+e\right)\text{Log}\left[-e+2\,c\sqrt{e}\sqrt{-1+c^2x^2}\sqrt{d+e\,x^2}+c^2\left(d+2\,e\,x^2\right)\right]\right)\right)\Big/\left(12\,c^3e^3\left(-1+c\,x\right)\right)$$

Problem 160: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 177 leaves, 9 steps):

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

Result (type 3, 213 leaves):

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

Problem 161: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 87 leaves, 5 steps):

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

Result (type 4, 573 leaves):

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

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

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

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

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

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

Problem 166: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 92 leaves, 4 steps):

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

Result (type 4, 334 leaves):

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

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

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

Problem 167: Unable to integrate problem.

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

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

$$\frac{b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\,\sqrt{d+e\,x^2}}{d^2\,x}-\frac{a+b\,\text{ArcSech}[c\,x]}{d\,x\,\sqrt{d+e\,x^2}}-\frac{2\,e\,x\,(a+b\,\text{ArcSech}[c\,x])}{d^2\,\sqrt{d+e\,x^2}}+$$

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

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

Result (type 8, 25 leaves):

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

Problem 168: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 272 leaves, 10 steps):

$$-\frac{b\,d\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{3\,e^2\,\left(c^2\,d+e\right)\,\sqrt{d+e\,x^2}}-\frac{d^2\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{3\,e^3\,\left(d+e\,x^2\right)^{3/2}}+\frac{2\,d\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{e^3\,\sqrt{d+e\,x^2}}+\frac{\sqrt{d+e\,x^2}\,\left(a+b\,\text{ArcSech}[c\,x]\right)}{e^3}-\frac{b\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcTan}\left[\frac{\sqrt{e}\,\sqrt{1-c^2\,x^2}}{c\,\sqrt{d+e\,x^2}}\right]}{c\,e^{5/2}}-\frac{8\,b\,\sqrt{d}\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x^2}}{\sqrt{d}\,\sqrt{1-c^2\,x^2}}\right]}{3\,e^3}$$

Result (type 3, 313 leaves):

$$\left(-b\,d\,e\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\left(1+c\,x\right)\,\left(d+e\,x^2\right)+a\,\left(c^2\,d+e\right)\,\left(8\,d^2+12\,d\,e\,x^2+3\,e^2\,x^4\right)+b\,\left(c^2\,d+e\right)\,\left(8\,d^2+12\,d\,e\,x^2+3\,e^2\,x^4\right)\,\text{ArcSech}[c\,x]\right)\Big/\left(3\,e^3\,\left(c^2\,d+e\right)\,\left(d+e\,x^2\right)^{3/2}\right)+\frac{1}{6\,c\,e^3\,\left(-1+c\,x\right)}\,i\,b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\sqrt{-1+c^2\,x^2}\,\left(8\,c\,\sqrt{d}\,\text{Log}\left[\frac{-i\,e\,x^2+i\,d\,\left(-2+c^2\,x^2\right)+2\,\sqrt{d}\,\sqrt{-1+c^2\,x^2}\,\sqrt{d+e\,x^2}}{8\,d^{3/2}\,x^2}\right]+3\,i\,\sqrt{e}\,\text{Log}\left[-e+2\,c\,\sqrt{e}\,\sqrt{-1+c^2\,x^2}\,\sqrt{d+e\,x^2}+c^2\,\left(d+2\,e\,x^2\right)\right]\right)$$

Problem 169: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 179 leaves, 7 steps):

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

Result (type 4, 656 leaves):

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

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

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

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

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

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

Problem 170: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 154 leaves, 6 steps):

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

Result (type 4, 645 leaves):

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

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

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

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

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

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

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

Problem 175: Unable to integrate problem.

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

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

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

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

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

Result (type 8, 25 leaves):

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

Problem 176: Unable to integrate problem.

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

Optimal (type 4, 266 leaves, 8 steps):

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

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

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

Result (type 8, 22 leaves):

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

Problem 177: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (f x)^m \left(d+e x^2\right)^3 (a+b \text{ArcSech}[c x]) \, dx$$

Optimal (type 5, 596 leaves, 5 steps):

$$-\left(\left(b e \left(e^2 \left(15+8 m+m^2\right)^2+3 c^2 d e (3+m)^2 \left(42+13 m+m^2\right)+3 c^4 d^2 \left(840+638 m+179 m^2+22 m^3+m^4\right)\right) (f x)^{1+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\right) \Big/ \left(c^6 f (2+m) (3+m) (4+m) (5+m) (6+m) (7+m)\right)\right) - \left(b e^2 \left(e (5+m)^2+3 c^2 d \left(42+13 m+m^2\right)\right) (f x)^{3+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\right) \Big/ \left(c^4 f^3 (4+m) (5+m) (6+m) (7+m)\right) - \frac{b e^3 (f x)^{5+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{c^2 f^5 (6+m) (7+m)} + \frac{d^3 (f x)^{1+m} (a+b \text{ArcSech}[c x])}{f (1+m)} + \frac{3 d^2 e (f x)^{3+m} (a+b \text{ArcSech}[c x])}{f^3 (3+m)} + \frac{3 d e^2 (f x)^{5+m} (a+b \text{ArcSech}[c x])}{f^5 (5+m)} + \frac{e^3 (f x)^{7+m} (a+b \text{ArcSech}[c x])}{f^7 (7+m)} + \left(b \left(\frac{c^6 d^3 (2+m) (4+m) (6+m)}{1+m} + \left(e (1+m) \left(e^2 \left(15+8 m+m^2\right)^2+3 c^2 d e (3+m)^2 \left(42+13 m+m^2\right)+3 c^4 d^2 \left(840+638 m+179 m^2+22 m^3+m^4\right)\right)\right) \Big/ \left((3+m) (5+m) (7+m)\right)\right) (f x)^{1+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \, \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, c^2 x^2\right]\right) \Big/ \left(c^6 f (1+m) (2+m) (4+m) (6+m)\right)$$

Result (type 6, 2335 leaves):

$$\frac{a d^3 x (f x)^m}{1+m}+\frac{3 a d^2 e x^3 (f x)^m}{3+m}+\frac{3 a d e^2 x^5 (f x)^m}{5+m}+\frac{a e^3 x^7 (f x)^m}{7+m}+\frac{1}{c}b d^3 (c x)^{-m} (f x)^m$$

$$\left(-\left(\left(12 (c x)^m \sqrt{\frac{1-c x}{1+c x}} (1+c x) \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right/\right.$$

$$\left((1+m) (-1+c x) \left(6 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]+\right.\right.$$

$$(1+c x) \left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]+\right.$$

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right)\right)\right)+$$

$$\left.\frac{(c x)^{1+m} \text{ArcSech}[c x]}{1+m}\right)+\frac{1}{c}3 b d^2 e x^2 (c x)^{-2-m} (f x)^m$$

$$\left(-\left(\left(4 (c x)^m \sqrt{\frac{1-c x}{1+c x}} (1+c x) \left(\left(3 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right/\left(6 \text{AppellF1}\left[\right.\right.\right.\right.\right.$$

$$\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]+(1+c x) \left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2} (1+c x),1+c x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right)+$$

$$\left(5 \left(-1+c^2 x^2\right) \text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\Big/\left(30 \text{AppellF1}\left[\right.\right.$$

$$\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]-3 (1+c x) \left(4 m \text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\right.\right.$$

$$\left.\left.\left.\left.\left.\frac{1}{2} (1+c x),1+c x\right]+\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right)\right)\right)\Big/$$

$$\left.\left.((3+m) (-1+c x))\right)+\frac{(c x)^{3+m} \text{ArcSech}[c x]}{3+m}\right)+\frac{1}{c}3 b d e^2 x^4 (c x)^{-4-m}$$

$$(f x)^m \left(-\frac{1}{7 (5+m) (-1+c x)}4 (c x)^m \sqrt{\frac{1-c x}{1+c x}} (1+c x)\right.$$

$$\left(\left(21 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right/$$

$$\left(6 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2} (1+c x),1+c x\right]+(1+c x) \left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-\right.\right.\right.$$

$$\left.\left.m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2} (1+c x),1+c x\right]\right)\right)+$$

$$\left(70\,(-1+c\,x)\,(1+c\,x)\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/$$
$$\left(30\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]-\right.$$
$$3\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)-$$
$$\left(98\,(-1+c\,x)\,(1+c\,x)^2\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/$$
$$\left(70\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]-\right.$$
$$5\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},1-m,\frac{9}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{7}{2},\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)-$$
$$\left(9\,(-1+c\,x)\,(1+c\,x)^3\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/$$
$$\left(-18\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},1-m,\frac{11}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)\right)+$$
$$\left.\frac{(c\,x)^{5+m}\,\text{ArcSech}[c\,x]}{5+m}\right)+\frac{1}{c}\,b\,e^3\,x^6\,(c\,x)^{-6-m}\,(f\,x)^m$$
$$\left(-\frac{1}{7+m}\left(\left(12\,(c\,x)^m\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/\right.\right.$$
$$\left((-1+c\,x)\,\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.\right.$$
$$(1+c\,x)\,\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)\right)+$$
$$\left(60\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/$$
$$\left((-1+c\,x)\,\left(-30\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.\right.$$
$$3\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)\right)-$$

$$\left(168\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^3\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/\left((-1+c\,x)\left(-70\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+5\,(1+c\,x)\left(4\,m\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},1-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{7}{2},\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)+$$

$$\left(36\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^4\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/\left((-1+c\,x)\left(-18\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+(1+c\,x)\left(4\,m\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},1-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)-$$

$$\left(176\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^5\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/\left(9\,(-1+c\,x)\left(-22\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+(1+c\,x)\left(4\,m\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},1-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{11}{2},\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)+$$

$$\left(52\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^6\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/\left(11\,(-1+c\,x)\left(-26\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+(1+c\,x)\left(4\,m\,\text{AppellF1}\left[\frac{13}{2},-\frac{1}{2},1-m,\frac{15}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{13}{2},\frac{1}{2},-m,\frac{15}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)\Bigg)+\frac{(c\,x)^{7+m}\,\text{ArcSech}[c\,x]}{7+m}\Bigg)$$

Problem 178: Result unnecessarily involves higher level functions and more

than twice size of optimal antiderivative.

$$\int (f x)^m \left(d+e x^2\right)^2 (a+b \text{ArcSech}[c x]) \, dx$$

Optimal (type 5, 372 leaves, 5 steps):

$$-\left(\left(b e \left(e (3+m)^2+2 c^2 d \left(20+9 m+m^2\right)\right) (f x)^{1+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\right) \Big/ \left(c^4 f (2+m) (3+m) (4+m) (5+m)\right)\right)-\frac{b e^2 (f x)^{3+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{c^2 f^3 (4+m) (5+m)}+$$

$$\frac{d^2 (f x)^{1+m} (a+b \text{ArcSech}[c x])}{f (1+m)}+\frac{2 d e (f x)^{3+m} (a+b \text{ArcSech}[c x])}{f^3 (3+m)}+$$

$$\frac{e^2 (f x)^{5+m} (a+b \text{ArcSech}[c x])}{f^5 (5+m)}+$$

$$\left(b \left(c^4 d^2 (2+m) (3+m) (4+m) (5+m)+e (1+m)^2 \left(e (3+m)^2+2 c^2 d \left(20+9 m+m^2\right)\right)\right) (f x)^{1+m} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \, \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, c^2 x^2\right]\right) \Big/ \left(c^4 f (1+m)^2 (2+m) (3+m) (4+m) (5+m)\right)$$

Result (type 6, 1240 leaves):

$$\frac{a d^2 x (f x)^m}{1+m}+\frac{2 a d e x^3 (f x)^m}{3+m}+\frac{a e^2 x^5 (f x)^m}{5+m}+\frac{1}{c} b d^2 (c x)^{-m} (f x)^m$$

$$\left(-\left(\left(12 (c x)^m \sqrt{\frac{1-c x}{1+c x}} (1+c x) \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, \frac{1}{2} (1+c x), 1+c x\right]\right) \Big/ \left((1+m) (-1+c x) \left(6 \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, \frac{1}{2} (1+c x), 1+c x\right]+(1+c x) \left(-4 m \, \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}, 1-m, \frac{5}{2}, \frac{1}{2} (1+c x), 1+c x\right]+\text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}, -m, \frac{5}{2}, \frac{1}{2} (1+c x), 1+c x\right]\right)\right)\right)\right)+\frac{(c x)^{1+m} \text{ArcSech}[c x]}{1+m}\right)+\frac{1}{c} 2 b d e x^2 (c x)^{-2-m} (f x)^m$$

$$\left(-\left(\left(4 (c x)^m \sqrt{\frac{1-c x}{1+c x}} (1+c x) \left(\left(3 \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, \frac{1}{2} (1+c x), 1+c x\right]\right) \Big/ \left(6 \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}, -m, \frac{3}{2}, \frac{1}{2} (1+c x), 1+c x\right]+(1+c x) \left(-4 m \, \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}, 1-m, \frac{5}{2},\right.\right.\right.\right.\right.\right.$$

$$\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{2},\,-m,\,\frac{5}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\Bigg)\Bigg)+$$

$$\left(5\left(-1+c^2x^2\right)\text{AppellF1}\left[\frac{3}{2},\,-\frac{1}{2},\,-m,\,\frac{5}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\right)\Big/\Bigg(30\,\text{AppellF1}\Big[$$

$$\frac{3}{2},\,-\frac{1}{2},\,-m,\,\frac{5}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\Big]-3\left(1+c\,x\right)\Bigg(4\,m\,\text{AppellF1}\Big[\frac{5}{2},\,-\frac{1}{2},\,1-m,\,\frac{7}{2},$$

$$\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\Big]+\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{2},\,-m,\,\frac{7}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(\left(3+m\right)\left(-1+c\,x\right)\right)\Bigg)+\frac{\left(c\,x\right)^{3+m}\text{ArcSech}[c\,x]}{3+m}\Bigg)+\frac{1}{c}\,b\,e^2x^4\left(c\,x\right)^{-4-m}$$

$$\left(f\,x\right)^m\Bigg(-\frac{1}{7\left(5+m\right)\left(-1+c\,x\right)}\,4\left(c\,x\right)^m\sqrt{\frac{1-c\,x}{1+c\,x}}\left(1+c\,x\right)$$

$$\Bigg(\left(21\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2},\,-m,\,\frac{3}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\right)\Big/$$

$$\Bigg(6\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2},\,-m,\,\frac{3}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+\left(1+c\,x\right)\Bigg(-4\,m\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{1}{2},\,1-$$

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

$$\left(70\left(-1+c\,x\right)\left(1+c\,x\right)\text{AppellF1}\left[\frac{3}{2},\,-\frac{1}{2},\,-m,\,\frac{5}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\right)\Big/$$

$$\Bigg(30\,\text{AppellF1}\left[\frac{3}{2},\,-\frac{1}{2},\,-m,\,\frac{5}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]-$$

$$3\left(1+c\,x\right)\Bigg(4\,m\,\text{AppellF1}\left[\frac{5}{2},\,-\frac{1}{2},\,1-m,\,\frac{7}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+$$

$$\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{2},\,-m,\,\frac{7}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\Bigg)\Bigg)-$$

$$\left(98\left(-1+c\,x\right)\left(1+c\,x\right)^2\text{AppellF1}\left[\frac{5}{2},\,-\frac{1}{2},\,-m,\,\frac{7}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\right)\Big/$$

$$\Bigg(70\,\text{AppellF1}\left[\frac{5}{2},\,-\frac{1}{2},\,-m,\,\frac{7}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]-$$

$$5\left(1+c\,x\right)\Bigg(4\,m\,\text{AppellF1}\left[\frac{7}{2},\,-\frac{1}{2},\,1-m,\,\frac{9}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+$$

$$\text{AppellF1}\left[\frac{7}{2},\,\frac{1}{2},\,-m,\,\frac{9}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\Bigg)\Bigg)-$$

$$\left(9\left(-1+c\,x\right)\left(1+c\,x\right)^3\text{AppellF1}\left[\frac{7}{2},\,-\frac{1}{2},\,-m,\,\frac{9}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]\right)\Big/$$

$$\Bigg(-18\,\text{AppellF1}\left[\frac{7}{2},\,-\frac{1}{2},\,-m,\,\frac{9}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+$$

$$\left(1+c\,x\right)\Bigg(4\,m\,\text{AppellF1}\left[\frac{9}{2},\,-\frac{1}{2},\,1-m,\,\frac{11}{2},\,\frac{1}{2}\left(1+c\,x\right),\,1+c\,x\right]+$$

$$\text{AppellF1}\left[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Bigg)\Bigg)\Bigg)+\frac{(c\,x)^{5+m}\,\text{ArcSech}[c\,x]}{5+m}\Bigg)$$

Problem 179: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (f\,x)^m\left(d+e\,x^2\right)(a+b\,\text{ArcSech}[c\,x])\,dx$$

Optimal (type 5, 206 leaves, 4 steps):

$$-\frac{b\,e\,(f\,x)^{1+m}\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{c^2\,f\,(2+m)\,(3+m)}+\frac{d\,(f\,x)^{1+m}\,(a+b\,\text{ArcSech}[c\,x])}{f\,(1+m)}+$$

$$\frac{e\,(f\,x)^{3+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^3\,(3+m)}+\Bigg(b\left(e\,(1+m)^2+c^2\,d\,(2+m)\,(3+m)\right)(f\,x)^{1+m}\sqrt{\frac{1}{1+c\,x}}$$

$$\sqrt{1+c\,x}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2\,x^2\right]\Bigg)\Big/\left(c^2\,f\,(1+m)^2\,(2+m)\,(3+m)\right)$$

Result (type 6, 529 leaves):

$$(f x)^m \left(\frac{a d x}{1+m}+\frac{a e x^3}{3+m}-\right.$$

$$\left(12 b d \sqrt{\frac{1-c x}{1+c x}} (1+c x) \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c x),1+c x\right]\right) \Big/ \left(c (1+m) (-1+c x)\right.$$

$$\left(6 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c x),1+c x\right]+(1+c x)\left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{5}{2},\frac{1}{2}(1+c x),1+c x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c x),1+c x\right]\right)\right)\right)-$$

$$\left(4 b e \sqrt{\frac{1-c x}{1+c x}} (1+c x) \left(\left(3 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c x),1+c x\right]\right) \Big/\right.\right.$$

$$\left(6 \text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c x),1+c x\right]+(1+c x)\left(-4 m \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\right.\right.\right.$$

$$\left.\left.\left.\frac{5}{2},\frac{1}{2}(1+c x),1+c x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c x),1+c x\right]\right)\right)+$$

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

$$\left(30 \text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c x),1+c x\right]-\right.$$

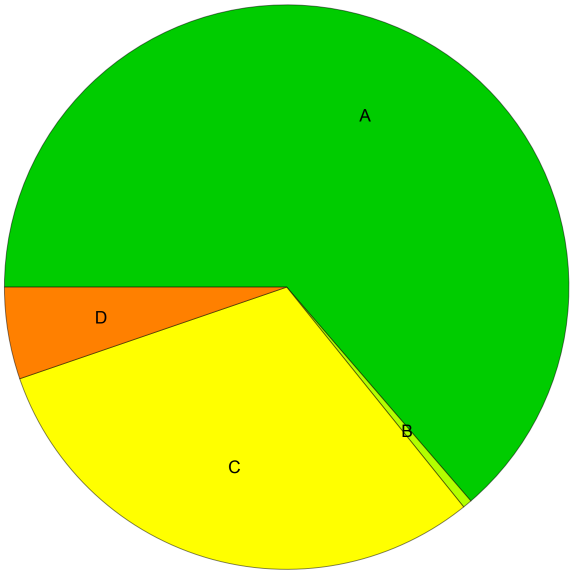
$$3 (1+c x)\left(4 m \text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c x),1+c x\right]+\right.$$

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c x),1+c x\right]\right)\right)\right)\right) \Big/$$

$$\left.\left(c^3 (3+m)(-1+c x)\right)+\frac{b d x \text{ArcSech}[c x]}{1+m}+\frac{b e x^3 \text{ArcSech}[c x]}{3+m}\right)$$

Summary of Integration Test Results

190 integration problems



A - 121 optimal antiderivatives

B - 1 more than twice size of optimal antiderivatives

C - 58 unnecessarily complex antiderivatives

D - 10 unable to integrate problems

E - 0 integration timeouts