Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "7 Inverse hyperbolic functions\7.5 Inverse hyperbolic secant"

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.

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

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

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

Result (type 3, 143 leaves):

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

Problem 21: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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.

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

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

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

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.

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

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

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

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):

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

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):

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

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

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):

$$\frac{a\,\text{Log}[d+e\,x]}{e}+$$

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

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

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

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

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):

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

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

Result (type 3, 342 leaves):

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

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

Problem 81: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

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

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

Result (type 4, 575 leaves):

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

$$\frac{1}{15\,c^2\,\sqrt{-\frac{c\,d+e}{c}}\,\sqrt{d+e\,x}\,(e-c\,e\,x)}\,4\,b\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,\Bigg(7\,c^2\,d^3\,\sqrt{-\frac{c\,d+e}{c}}-7\,d\,e^2\,\sqrt{-\frac{c\,d+e}{c}}-14\,c^2\,d^2\,\sqrt{-\frac{c\,d+e}{c}}\,(d+e\,x)+$$

$$7\,c^2\,d\,\sqrt{-\frac{c\,d+e}{c}}\,(d+e\,x)^2-7\,i\,c\,d\,(c\,d+e)\,\sqrt{\frac{e\,(-1+c\,x)}{c\,(d+e\,x)}}\,(d+e\,x)^{3/2}\,\sqrt{\frac{e+c\,e\,x}{c\,d+c\,e\,x}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{-\frac{c\,d+e}{c}}}{\sqrt{d+e\,x}}\Big],\frac{c\,d-e}{c\,d+e}\Big]+$$

$$i\,(6\,c^2\,d^2+7\,c\,d\,e+e^2)\,\sqrt{\frac{e\,(-1+c\,x)}{c\,(d+e\,x)}}\,(d+e\,x)^{3/2}\,\sqrt{\frac{e+c\,e\,x}{c\,d+c\,e\,x}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{-\frac{c\,d+e}{c}}}{\sqrt{d+e\,x}}\Big],\frac{c\,d-e}{c\,d+e}\Big]+$$

$$3\,i\,c^2\,d^2\,\sqrt{\frac{e\,(-1+c\,x)}{c\,(d+e\,x)}}\,(d+e\,x)^{3/2}\,\sqrt{\frac{e+c\,e\,x}{c\,d+c\,e\,x}}\,\text{EllipticPi}\Big[\frac{c\,d}{c\,d+e},i\,\text{ArcSinh}\Big[\frac{\sqrt{-\frac{c\,d+e}{c}}}{\sqrt{d+e\,x}}\Big],\frac{c\,d-e}{c\,d+e}\Big]\Bigg)$$

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):

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

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

Result (type 4, 279 leaves):

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

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

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

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):

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

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

Result (type 4, 286 leaves):

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

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):

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

Result (type 4, 223 leaves):

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

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):

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

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

Result (type 4, 698 leaves):

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

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

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

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

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

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

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):

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

Result (type 4, 1193 leaves):

$$-\frac{2 a}{5 e (d+e x)^{5/2}}+\sqrt{\frac{1-c x}{1+c x}} \sqrt{d+e x} \left(\frac{4 b c \left(7 c^2 d^2-3 e^2\right)}{15 d^2 \left(c^2 d^2-e^2\right)^2}-\frac{4 b}{15 d (c d+e) (d+e x)^2}-\frac{4 b \left(6 c^2 d^2-c d e-3 e^2\right)}{15 d^2 (c d-e) (c d+e)^2 (d+e x)}\right)-$$
$$\frac{2 b \,\text{ArcSech}[c x]}{5 e (d+e x)^{5/2}}-\frac{1}{15 d^3 \sqrt{-\frac{c d+e}{c}} \left(c^2 d^2-e^2\right)^2 \left(\frac{e}{d+e x}+c \left(-1+\frac{d}{d+e x}\right)\right)}$$
$$4 b \sqrt{d+e x} \sqrt{-\frac{c-\frac{c d}{d+e x}-\frac{e}{d+e x}}{c-\frac{c d}{d+e x}+\frac{e}{d+e x}}} \left(-7 c^4 d^3 \sqrt{-\frac{c d+e}{c}}+3 c^2 d e^2 \sqrt{-\frac{c d+e}{c}}-\frac{7 c^4 d^5 \sqrt{-\frac{c d+e}{c}}}{(d+e x)^2}+\frac{10 c^2 d^3 e^2 \sqrt{-\frac{c d+e}{c}}}{(d+e x)^2}-\frac{3 d e^4 \sqrt{-\frac{c d+e}{c}}}{(d+e x)^2}+\right.$$
$$\frac{14 c^4 d^4 \sqrt{-\frac{c d+e}{c}}}{d+e x}-\frac{6 c^2 d^2 e^2 \sqrt{-\frac{c d+e}{c}}}{d+e x}+\frac{1}{\sqrt{d+e x}} i c d \left(7 c^3 d^3+7 c^2 d^2 e-3 c d e^2-3 e^3\right) \sqrt{1-\frac{d}{d+e x}-\frac{e}{c (d+e x)}}$$

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

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

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

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

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

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):

$$-\frac{b\,\left(42\,c^2\,d+25\,e\right)\,x\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{560\,c^6}-\frac{b\,\left(42\,c^2\,d+25\,e\right)\,x^3\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{840\,c^4}-\frac{b\,e\,x^5\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{42\,c^2}+$$

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

Result (type 3, 162 leaves):

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

Problem 89: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 144 leaves):

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

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):

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

Problem 100: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{b \left(280 c^4 d^2+252 c^2 d e+75 e^2\right) x \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{1680 c^6}-\frac{b e \left(84 c^2 d+25 e\right) x^3 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{840 c^4}-$$
$$\frac{b e^2 x^5 \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}}{42 c^2}+\frac{1}{3} d^2 x^3 (a+b \text{ArcSech}[c x])+\frac{2}{5} d e x^5 (a+b \text{ArcSech}[c x])+$$
$$\frac{1}{7} e^2 x^7 (a+b \text{ArcSech}[c x])+\frac{b \left(280 c^4 d^2+252 c^2 d e+75 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ArcSin}[c x]}{1680 c^7}$$

Result (type 3, 207 leaves):

$$\frac{1}{1680 c^7}\left(16 a c^7 x^3 \left(35 d^2+42 d e x^2+15 e^2 x^4\right)-b c x \sqrt{\frac{1-c x}{1+c x}} (1+c x) \left(75 e^2+2 c^2 e \left(126 d+25 e x^2\right)+8 c^4 \left(35 d^2+21 d e x^2+5 e^2 x^4\right)\right)+\right.$$
$$\left.16 b c^7 x^3 \left(35 d^2+42 d e x^2+15 e^2 x^4\right) \text{ArcSech}[c x]+i b \left(280 c^4 d^2+252 c^2 d e+75 e^2\right) \text{Log}\left[-2 i c x+2 \sqrt{\frac{1-c x}{1+c x}} (1+c x)\right]\right)$$

Problem 101: Result unnecessarily involves imaginary or complex numbers.

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

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

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

$$\frac{2}{3}\,d\,e\,x^3\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{1}{5}\,e^2\,x^5\,\left(a+b\,\text{ArcSech}[c\,x]\right)+\frac{b\,\left(120\,c^4\,d^2+40\,c^2\,d\,e+9\,e^2\right)\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcSin}[c\,x]}{120\,c^5}$$

Result (type 3, 174 leaves):

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

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

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):

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

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

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) :

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

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

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

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

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

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

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

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

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

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, 459 leaves, 26 steps):

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

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

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

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

Result (type 4, 860 leaves):

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

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

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

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

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

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

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

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

Problem 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) :

$$
\begin{aligned}
&\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]+\\
&\quad 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]-\\
&\quad 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]+\\
&\quad 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]+\\
&\quad 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]-\\
&\quad 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]-\\
&\quad 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]+\\
&\quad 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]\Bigg)
\end{aligned}
$$

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) :

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

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

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

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

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

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

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

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

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):

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

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

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

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

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

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

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

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

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

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

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

Optimal (type 4, 631 leaves, 32 steps):

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

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

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

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

Result (type 4, 1397 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Optimal (type 4, 580 leaves, 30 steps) :

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

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

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

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

Result (type 4, 1208 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

Result (type 4, 1189 leaves):

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

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

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

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

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

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

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

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

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

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

Problem 119: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

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

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

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

Result (type 4, 1270 leaves):

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

$$\frac{8\,b\,\sqrt{e}\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]\right]}{c}+12\,b\,\sqrt{d}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\,\sqrt{e}}{c\,\sqrt{d}}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(-i\,c\,\sqrt{d}+\sqrt{e}\right)\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[c\,x]\right]}{\sqrt{c^2\,d+e}}\right]-$$

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

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

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

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

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

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

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

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

Problem 120: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

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

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

Result (type 4, 1226 leaves):

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

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

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

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

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

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

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

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

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):

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

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

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

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

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

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

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

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

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):

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

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

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

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

Result (type 4, 1305 leaves) :

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

$$\frac{b \sqrt{d} e \operatorname{ArcSech}[c x]}{i \sqrt{d} \sqrt{e}+e x}-6 a \sqrt{e} \operatorname{ArcTan}\left[\frac{\sqrt{e} x}{\sqrt{d}}\right]+12 b \sqrt{e} \operatorname{ArcSin}\left[\frac{\sqrt{1-\frac{i \sqrt{e}}{c \sqrt{d}}}}{\sqrt{2}}\right] \operatorname{ArcTanh}\left[\frac{\left(-i c \sqrt{d}+\sqrt{e}\right) \operatorname{Tanh}\left[\frac{1}{2} \operatorname{ArcSech}[c x]\right]}{\sqrt{c^2 d+e}}\right]-$$

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

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

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

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

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

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

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

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

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, 778 leaves, 35 steps):

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

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

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

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

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

Result (type 4, 2000 leaves):

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

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

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

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

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

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

$$\frac{7 i \sqrt{d}\left(-\frac{\text{ArcSech}[c x]}{-i\sqrt{d}\sqrt{e}+e x}-\frac{i\left(\frac{\text{Log}[x]}{\sqrt{e}}-\frac{\text{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x\sqrt{\frac{1-c x}{1+c x}}\right]}{\sqrt{e}}+\frac{\text{Log}\left[\frac{2\sqrt{e}\left(i\sqrt{d}\sqrt{\frac{1-c x}{1+c x}}(1+c x)+\frac{i\sqrt{d}\sqrt{e}+c^2 d x}{\sqrt{c^2 d+e}}\right)}{-i\sqrt{d}+\sqrt{e}\,x}\right]}{\sqrt{c^2 d+e}}\right)}{\sqrt{d}}\right)}{16 e^{5/2}}+\frac{1}{4 e^3}\left(\text{PolyLog}\left[2,-e^{-2\,\text{ArcSech}[c x]}\right]-\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 3, 486 leaves):

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

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

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

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

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

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

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

Result (type 3, 486 leaves):

$$\frac{1}{16}\left(-\frac{4 a}{e\left(d+e x^2\right)^2}-\frac{2\sqrt{\frac{1-c x}{1+c x}}(b+b c x)}{d\left(c^2 d+e\right)\left(d+e x^2\right)}-\frac{4 b \operatorname{ArcSech}[c x]}{e\left(d+e x^2\right)^2}-\frac{4 b \operatorname{Log}[x]}{d^2 e}+\right.$$
$$\frac{4 b \operatorname{Log}\left[1+\sqrt{\frac{1-c x}{1+c x}}+c x\sqrt{\frac{1-c x}{1+c x}}\right]}{d^2 e}-\frac{b\left(3 c^2 d+2 e\right)\operatorname{Log}\left[\frac{16 d^2\sqrt{e}\sqrt{c^2 d+e}\left(\sqrt{e}-i c^2\sqrt{d}\, x+\sqrt{c^2 d+e}\sqrt{\frac{1-c x}{1+c x}}+c\sqrt{c^2 d+e}\, x\sqrt{\frac{1-c x}{1+c x}}\right)}{b\left(3 c^2 d+2 e\right)\left(-i\sqrt{d}+\sqrt{e}\, x\right)}\right]}{d^2\sqrt{e}\left(c^2 d+e\right)^{3/2}}-$$
$$\left.\frac{b\left(3 c^2 d+2 e\right)\operatorname{Log}\left[\frac{16 d^2\sqrt{e}\sqrt{c^2 d+e}\left(\sqrt{e}+i c^2\sqrt{d}\, x+\sqrt{c^2 d+e}\sqrt{\frac{1-c x}{1+c x}}+c\sqrt{c^2 d+e}\, x\sqrt{\frac{1-c x}{1+c x}}\right)}{b\left(3 c^2 d+2 e\right)\left(i\sqrt{d}+\sqrt{e}\, x\right)}\right]}{d^2\sqrt{e}\left(c^2 d+e\right)^{3/2}}\right)$$

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

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

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

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

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

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

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

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

Result (type 4, 2054 leaves) :

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 127: Result unnecessarily involves imaginary or complex numbers.

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

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):

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

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

$$\left.\frac{(2 c^2 d+e)\,\text{Log}\left[-\frac{4 d\sqrt{e}\sqrt{c^2 d+e}\left(\sqrt{e}-i c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\sqrt{\frac{1-c x}{1+c x}}+c\sqrt{c^2 d+e}\,x\sqrt{\frac{1-c x}{1+c x}}\right)}{(2 c^2 d+e)\left(-i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{d\,(c^2 d+e)^{3/2}}\right)-\frac{1}{16 e^2}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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) :

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

$$\frac{b\left(29 c^2 d-25 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{840 c^4 e^2}-\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{5/2}}{42 c^2 e^2}+$$

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

$$\frac{b\left(105 c^6 d^3-35 c^4 d^2 e+63 c^2 d e^2+75 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcTan}\left[\frac{\sqrt{e} \sqrt{1-c^2 x^2}}{c \sqrt{d+e x^2}}\right]}{1680 c^7 e^{5/2}}-\frac{8 b d^{7/2} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d} \sqrt{1-c^2 x^2}}\right]}{105 e^3}$$

Result (type 3, 396 leaves) :

$$\frac{1}{1680 c^6 e^3}$$

$$\sqrt{d+e x^2}\left(16 a c^6\left(8 d^3-4 d^2 e x^2+3 d e^2 x^4+15 e^3 x^6\right)-b e \sqrt{\frac{1-c x}{1+c x}}(1+c x)\left(75 e^2+2 c^2 e\left(19 d+25 e x^2\right)+c^4\left(-41 d^2+22 d e x^2+40 e^2 x^4\right)\right)+\right.$$

$$\left.16 b c^6\left(8 d^3-4 d^2 e x^2+3 d e^2 x^4+15 e^3 x^6\right) \operatorname{ArcSech}[c x]\right)-\frac{1}{3360 c^7 e^3(-1+c x)}$$

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

$$\left.\sqrt{e}\left(105 c^6 d^3-35 c^4 d^2 e+63 c^2 d e^2+75 e^3\right) \operatorname{Log}\left[-e+2 c \sqrt{e} \sqrt{-1+c^2 x^2} \sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)$$

Problem 131: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 333 leaves):

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

Problem 132: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 275 leaves):

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

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

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

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):

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

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

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

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):

$$\frac{b\left(12 c^2 d-e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{225 d x^3}+\frac{b\left(24 c^4 d^2+19 c^2 d e-31 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{225 d^2 x}+$$
$$\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \left(d+e x^2\right)^{3/2}}{25 d x^5}-\frac{\left(d+e x^2\right)^{3/2} (a+b \operatorname{ArcSech}[c x])}{5 d x^5}+\frac{2 e \left(d+e x^2\right)^{3/2} (a+b \operatorname{ArcSech}[c x])}{15 d^2 x^3}+$$
$$\frac{b c \left(24 c^4 d^2+19 c^2 d e-31 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{d+e x^2} \operatorname{EllipticE}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]}{225 d^2 \sqrt{1+\frac{e x^2}{d}}}-$$
$$\frac{b\left(c^2 d+e\right)\left(24 c^4 d^2+7 c^2 d e-30 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1+\frac{e x^2}{d}} \operatorname{EllipticF}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]}{225 c d^2 \sqrt{d+e x^2}}$$

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):

$$\frac{b\left(3 c^4 d^2-38 c^2 d e-25 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{560 c^6 e}-\frac{b\left(13 c^2 d+25 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \left(d+e x^2\right)^{3/2}}{840 c^4 e}-$$
$$\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \left(d+e x^2\right)^{5/2}}{42 c^2 e}-\frac{d \left(d+e x^2\right)^{5/2} (a+b \operatorname{ArcSech}[c x])}{5 e^2}+\frac{\left(d+e x^2\right)^{7/2} (a+b \operatorname{ArcSech}[c x])}{7 e^2}+$$
$$\frac{b\left(35 c^6 d^3-35 c^4 d^2 e-63 c^2 d e^2-25 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcTan}\left[\frac{\sqrt{e} \sqrt{1-c^2 x^2}}{c \sqrt{d+e x^2}}\right]}{560 c^7 e^{3/2}}+\frac{2 b d^{7/2} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \operatorname{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d} \sqrt{1-c^2 x^2}}\right]}{35 e^2}$$

Result (type 3, 369 leaves):

$$-\frac{1}{1680 c^6 e^2}\sqrt{d+e x^2}\left(48 a c^6 \left(2 d-5 e x^2\right)\left(d+e x^2\right)^2+\right.$$
$$\left.b e \sqrt{\frac{1-c x}{1+c x}}\left(1+c x\right)\left(75 e^2+2 c^2 e\left(82 d+25 e x^2\right)+c^4\left(57 d^2+106 d e x^2+40 e^2 x^4\right)\right)+48 b c^6\left(2 d-5 e x^2\right)\left(d+e x^2\right)^2 \text{ArcSech}[c x]\right)-$$
$$\frac{1}{1120 c^7 e^2 (-1+c x)} b \sqrt{\frac{1-c x}{1+c x}}\sqrt{-1+c^2 x^2}\left(32 i c^7 d^{7/2} \text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}}{32 c^6 d^{9/2} x^2}\right]+\right.$$
$$\left.\sqrt{e}\left(-35 c^6 d^3+35 c^4 d^2 e+63 c^2 d e^2+25 e^3\right) \text{Log}\left[-e+2 c\sqrt{e}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)$$

Problem 141: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{b\left(7 c^2 d+3 e\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\sqrt{d+e x^2}}{40 c^4}-\frac{b\sqrt{\frac{1}{1+c x}}\sqrt{1+c x}\sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{20 c^2}+\frac{\left(d+e x^2\right)^{5/2}(a+b \text{ArcSech}[c x])}{5 e}-$$
$$\frac{b\left(15 c^4 d^2+10 c^2 d e+3 e^2\right)\sqrt{\frac{1}{1+c x}}\sqrt{1+c x} \text{ArcTan}\left[\frac{\sqrt{e}\sqrt{1-c^2 x^2}}{c\sqrt{d+e x^2}}\right]}{40 c^5\sqrt{e}}-\frac{b d^{5/2}\sqrt{\frac{1}{1+c x}}\sqrt{1+c x} \text{ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d}\sqrt{1-c^2 x^2}}\right]}{5 e}$$

Result (type 3, 313 leaves):

$$\frac{1}{40 c^4 e}\sqrt{d+e x^2}\left(8 a c^4\left(d+e x^2\right)^2-b e\sqrt{\frac{1-c x}{1+c x}}(1+c x)\left(3 e+c^2\left(9 d+2 e x^2\right)\right)+8 b c^4\left(d+e x^2\right)^2 \text{ArcSech}[c x]\right)+$$
$$\frac{1}{80 c^5 e(-1+c x)} i b\sqrt{\frac{1-c x}{1+c x}}\sqrt{-1+c^2 x^2}\left(8 c^5 d^{5/2} \text{Log}\left[\frac{-i e x^2+i d\left(-2+c^2 x^2\right)+2\sqrt{d}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}}{8 c^4 d^{7/2} x^2}\right]+\right.$$
$$\left.i\sqrt{e}\left(15 c^4 d^2+10 c^2 d e+3 e^2\right) \text{Log}\left[-e+2 c\sqrt{e}\sqrt{-1+c^2 x^2}\sqrt{d+e x^2}+c^2\left(d+2 e x^2\right)\right]\right)$$

Problem 148: Unable to integrate problem.

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

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

$$\frac{4 b \left(c^2 d+2 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{75 x^3}+\frac{b \left(8 c^4 d^2+23 c^2 d e+23 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{75 d x}+\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \left(d+e x^2\right)^{3/2}}{25 x^5}-\frac{\left(d+e x^2\right)^{5/2} \left(a+b \text{ArcSech}[c x]\right)}{5 d x^5}+\frac{b c \left(8 c^4 d^2+23 c^2 d e+23 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{d+e x^2} \text{EllipticE}\left[\text{ArcSin}[c x],-\frac{e}{c^2 d}\right]}{75 d \sqrt{1+\frac{e x^2}{d}}}-\frac{b \left(c^2 d+e\right) \left(8 c^4 d^2+19 c^2 d e+15 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1+\frac{e x^2}{d}} \text{EllipticF}\left[\text{ArcSin}[c x],-\frac{e}{c^2 d}\right]}{75 c d \sqrt{d+e x^2}}$$

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):

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

$$\frac{b\left(240 c^6 d^3+528 c^4 d^2 e+193 c^2 d e^2-247 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{3675 d^2 x}+\frac{b\left(30 c^2 d+11 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{1225 d x^5}+$$

$$\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{5/2}}{49 d x^7}-\frac{\left(d+e x^2\right)^{5/2}(a+b \operatorname{ArcSech}[c x])}{7 d x^7}+\frac{2 e\left(d+e x^2\right)^{5/2}(a+b \operatorname{ArcSech}[c x])}{35 d^2 x^5}+\frac{1}{3675 d^2 \sqrt{1+\frac{e x^2}{d}}}$$

$$b c\left(240 c^6 d^3+528 c^4 d^2 e+193 c^2 d e^2-247 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{d+e x^2} \operatorname{EllipticE}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]-\frac{1}{3675 c d^2 \sqrt{d+e x^2}}$$

$$2 b\left(c^2 d+e\right)\left(120 c^6 d^3+204 c^4 d^2 e+17 c^2 d e^2-105 e^3\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1+\frac{e x^2}{d}} \operatorname{EllipticF}\left[\operatorname{ArcSin}[c x],-\frac{e}{c^2 d}\right]$$

Result (type 8, 25 leaves):

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

Problem 150: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{b\left(19 c^2 d-9 e\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2} \sqrt{d+e x^2}}{120 c^4 e^2}-\frac{b \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \sqrt{1-c^2 x^2}\left(d+e x^2\right)^{3/2}}{20 c^2 e^2}+$$
$$\frac{d^2 \sqrt{d+e x^2}\,(a+b \text{ArcSech}[c x])}{e^3}-\frac{2 d\left(d+e x^2\right)^{3/2}(a+b \text{ArcSech}[c x])}{3 e^3}+\frac{\left(d+e x^2\right)^{5/2}(a+b \text{ArcSech}[c x])}{5 e^3}-$$
$$\frac{b\left(45 c^4 d^2-10 c^2 d e+9 e^2\right) \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ ArcTan}\left[\frac{\sqrt{e} \sqrt{1-c^2 x^2}}{c \sqrt{d+e x^2}}\right]}{120 c^5 e^{5/2}}-\frac{8 b d^{5/2} \sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ ArcTanh}\left[\frac{\sqrt{d+e x^2}}{\sqrt{d} \sqrt{1-c^2 x^2}}\right]}{15 e^3}$$

Result (type 3, 334 leaves):

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

Problem 151: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 280 leaves):

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

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

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

Problem 152: Unable to integrate problem.

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

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

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

Result (type 8, 23 leaves):

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

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):

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

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

Result (type 8, 25 leaves):

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

Problem 158: Unable to integrate problem.

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

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

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

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

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

Result (type 8, 25 leaves):

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

Problem 159: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 310 leaves):

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

Problem 160: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 213 leaves):

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

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

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

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

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

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

Result (type 4, 573 leaves):

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

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

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

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

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

Problem 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):

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

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

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):

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

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

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

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

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

Problem 170: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 154 leaves, 6 steps):

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

Result (type 4, 645 leaves):

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

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

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

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

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

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.

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

Optimal (type 5, 596 leaves, 5 steps):

$$-\left(\left(b\,e\,\left(e^2\,(15+8\,m+m^2)^2+3\,c^2\,d\,e\,(3+m)^2\,(42+13\,m+m^2)+3\,c^4\,d^2\,(840+638\,m+179\,m^2+22\,m^3+m^4)\right)\,(f\,x)^{1+m}\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}\right)\Big/\right.$$

$$\left.\left(c^6\,f\,(2+m)\,(3+m)\,(4+m)\,(5+m)\,(6+m)\,(7+m)\right)\right)-\frac{b\,e^2\,\left(e\,(5+m)^2+3\,c^2\,d\,(42+13\,m+m^2)\right)\,(f\,x)^{3+m}\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{c^4\,f^3\,(4+m)\,(5+m)\,(6+m)\,(7+m)}-$$

$$\frac{b\,e^3\,(f\,x)^{5+m}\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{c^2\,f^5\,(6+m)\,(7+m)}+\frac{d^3\,(f\,x)^{1+m}\,(a+b\,\text{ArcSech}[c\,x])}{f\,(1+m)}+\frac{3\,d^2\,e\,(f\,x)^{3+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^3\,(3+m)}+$$

$$\frac{3\,d\,e^2\,(f\,x)^{5+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^5\,(5+m)}+\frac{e^3\,(f\,x)^{7+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^7\,(7+m)}+\left(b\,\left(\frac{c^6\,d^3\,(2+m)\,(4+m)\,(6+m)}{1+m}+\right.\right.$$

$$\left.\frac{1}{(3+m)\,(5+m)\,(7+m)}e\,(1+m)\,\left(e^2\,(15+8\,m+m^2)^2+3\,c^2\,d\,e\,(3+m)^2\,(42+13\,m+m^2)+3\,c^4\,d^2\,(840+638\,m+179\,m^2+22\,m^3+m^4)\right)\right)$$

$$\left.(f\,x)^{1+m}\,\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2\,x^2\right]\right)\Big/\left(c^6\,f\,(1+m)\,(2+m)\,(4+m)\,(6+m)\right)$$

Result (type 6, 2335 leaves):

$$\frac{a\,d^3\,x\,(f\,x)^m}{1+m}+\frac{3\,a\,d^2\,e\,x^3\,(f\,x)^m}{3+m}+\frac{3\,a\,d\,e^2\,x^5\,(f\,x)^m}{5+m}+\frac{a\,e^3\,x^7\,(f\,x)^m}{7+m}+\frac{1}{c}$$

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

$$\left((1+m)\,(-1+c\,x)\,\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.\right.$$

$$\left.\left.\left.(1+c\,x)\,\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)\right)\right)+$$

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

$$\left(\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\right.\right.$$

$$(1+c\,x)\ \Big(-4\,m\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)+$$

$$\Big(5\,(-1+c^2x^2)\ \text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big/\Big(30\,\text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]-$$

$$3\,(1+c\,x)\ \Big(4\,m\,\text{AppellF1}\Big[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)\Big)+$$

$$\frac{(c\,x)^{3+m}\,\text{ArcSech}[c\,x]}{3+m}\Bigg)+\frac{1}{c}\,3\,b\,d\,e^2\,x^4\,(c\,x)^{-4-m}\,(f\,x)^m\Bigg(-\frac{1}{7\,(5+m)\,(-1+c\,x)}\,4\,(c\,x)^m\sqrt{\frac{1-c\,x}{1+c\,x}}\ (1+c\,x)$$

$$\Big(\Big(21\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big/\Big(6\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+$$

$$(1+c\,x)\ \Big(-4\,m\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)+$$

$$\Big(70\,(-1+c\,x)\ (1+c\,x)\ \text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big/\Big(30\,\text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]-$$

$$3\,(1+c\,x)\ \Big(4\,m\,\text{AppellF1}\Big[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)-$$

$$\Big(98\,(-1+c\,x)\ (1+c\,x)^2\,\text{AppellF1}\Big[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big/\Big(70\,\text{AppellF1}\Big[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]-$$

$$5\,(1+c\,x)\ \Big(4\,m\,\text{AppellF1}\Big[\frac{7}{2},-\frac{1}{2},1-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{7}{2},\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)-$$

$$\Big(9\,(-1+c\,x)\ (1+c\,x)^3\,\text{AppellF1}\Big[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big/\Big(-18\,\text{AppellF1}\Big[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+$$

$$(1+c\,x)\ \Big(4\,m\,\text{AppellF1}\Big[\frac{9}{2},-\frac{1}{2},1-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)\Big)+$$

$$\frac{(c\,x)^{5+m}\,\text{ArcSech}[c\,x]}{5+m}\Bigg)+\frac{1}{c}\,b\,e^3\,x^6\,(c\,x)^{-6-m}\,(f\,x)^m\Bigg(-\frac{1}{7+m}\Bigg(\Bigg(12\,(c\,x)^m\sqrt{\frac{1-c\,x}{1+c\,x}}\ (1+c\,x)\ \text{AppellF1}\Big[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Bigg)\Big/$$

$$\Big(\Big(-1+c\,x\Big)\ \Big(6\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+$$

$$(1+c\,x)\ \Big(-4\,m\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+\text{AppellF1}\Big[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Big)\Big)\Big)+$$

$$\Bigg(60\,(c\,x)^m\,(1-c\,x)\ \sqrt{\frac{1-c\,x}{1+c\,x}}\ (1+c\,x)^2\,\text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]\Bigg)\Big/$$

$$\Big(\Big(-1+c\,x\Big)\ \Big(-30\,\text{AppellF1}\Big[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\Big]+$$

$$3\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big)\Big)-$$

$$\left(168\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^3\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/$$

$$\Big(\Big((-1+c\,x)\,\Big(-70\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+$$

$$5\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},1-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{7}{2},\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big)\Big)+$$

$$\left(36\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^4\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/$$

$$\Big(\Big((-1+c\,x)\,\Big(-18\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+$$

$$(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},1-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big)\Big)-$$

$$\left(176\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^5\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/$$

$$\Big(9\,(-1+c\,x)\,\Big(-22\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+$$

$$(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},1-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{11}{2},\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big)\Big)+$$

$$\left(52\,(c\,x)^m\,(1-c\,x)\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)^6\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/$$

$$\Big(11\,(-1+c\,x)\,\Big(-26\,\text{AppellF1}\left[\frac{11}{2},-\frac{1}{2},-m,\frac{13}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+(1+c\,x)\,\Big(4\,m\,\text{AppellF1}\left[\frac{13}{2},-\frac{1}{2},1-m,\frac{15}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+$$

$$\text{AppellF1}\left[\frac{13}{2},\frac{1}{2},-m,\frac{15}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Big)\Big)\Big)\Big)+\frac{(c\,x)^{7+m}\,\text{ArcSech}[c\,x]}{7+m}\Big)$$

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):

$$-\frac{b\,e\left(e\,(3+m)^2+2\,c^2\,d\,(20+9\,m+m^2)\right)(f\,x)^{1+m}\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{c^4\,f\,(2+m)\,(3+m)\,(4+m)\,(5+m)}-\frac{b\,e^2\,(f\,x)^{3+m}\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\sqrt{1-c^2\,x^2}}{c^2\,f^3\,(4+m)\,(5+m)}+\frac{d^2\,(f\,x)^{1+m}\,(a+b\,\text{ArcSech}[c\,x])}{f\,(1+m)}+\frac{2\,d\,e\,(f\,x)^{3+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^3\,(3+m)}+\frac{e^2\,(f\,x)^{5+m}\,(a+b\,\text{ArcSech}[c\,x])}{f^5\,(5+m)}+\left(b\left(c^4\,d^2\,(2+m)\,(3+m)\,(4+m)\,(5+m)+e\,(1+m)^2\left(e\,(3+m)^2+2\,c^2\,d\,(20+9\,m+m^2)\right)\right)(f\,x)^{1+m}\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2\,x^2\right]\right)\Big/\left(c^4\,f\,(1+m)^2\,(2+m)\,(3+m)\,(4+m)\,(5+m)\right)$$

Result (type 6, 1240 leaves):

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

$$\left(\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+(1+c\,x)\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\right)+\left(5\,(-1+c^2\,x^2)\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]\right)\Big/\left(30\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}\,(1+c\,x),1+c\,x\right]-\right.\right.$$

$$3\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Bigg)\Bigg)+$$

$$\frac{(c\,x)^{3+m}\,\text{ArcSech}[c\,x]}{3+m}\Bigg)+\frac{1}{c}\,b\,e^2\,x^4\,(c\,x)^{-4-m}\,(f\,x)^m\,\Bigg(-\frac{1}{7\,(5+m)\,(-1+c\,x)}\,4\,(c\,x)^m\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)$$

$$\Bigg(\Bigg(21\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Bigg)\Big/\Bigg(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+$$

$$(1+c\,x)\,\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Bigg)+$$

$$\Bigg(70\,(-1+c\,x)\,(1+c\,x)\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Bigg)\Big/\Bigg(30\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]-$$

$$3\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Bigg)-$$

$$\Bigg(98\,(-1+c\,x)\,(1+c\,x)^2\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Bigg)\Big/\Bigg(70\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]-$$

$$5\,(1+c\,x)\,\left(4\,m\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},1-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{7}{2},\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Bigg)-$$

$$\Bigg(9\,(-1+c\,x)\,(1+c\,x)^3\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\Bigg)\Big/\Bigg(-18\,\text{AppellF1}\left[\frac{7}{2},-\frac{1}{2},-m,\frac{9}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+(1+c\,x)$$

$$\left(4\,m\,\text{AppellF1}\left[\frac{9}{2},-\frac{1}{2},1-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{9}{2},\frac{1}{2},-m,\frac{11}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Bigg)\Bigg)+\frac{(c\,x)^{5+m}\,\text{ArcSech}[c\,x]}{5+m}\Bigg)$$

Problem 179: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 5, 206 leaves, 4 steps):

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

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

Result (type 6, 529 leaves) :

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

$$\left(c\,(1+m)\,(-1+c\,x)\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\right.\right.$$

$$\left.\left.(1+c\,x)\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)-\frac{1}{c^3\,(3+m)\,(-1+c\,x)}$$

$$4\,b\,e\,\sqrt{\frac{1-c\,x}{1+c\,x}}\,(1+c\,x)\left(\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\Big/\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2},-m,\frac{3}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\right.\right.$$

$$\left.(1+c\,x)\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\text{AppellF1}\left[\frac{3}{2},\frac{3}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)+$$

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

$$\left(30\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},-m,\frac{5}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]-3\,(1+c\,x)\left(4\,m\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{2},1-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]+\right.\right.$$

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},-m,\frac{7}{2},\frac{1}{2}(1+c\,x),1+c\,x\right]\right)\right)\right)+\frac{b\,d\,x\,\text{ArcSech}[c\,x]}{1+m}+\frac{b\,e\,x^3\,\text{ArcSech}[c\,x]}{3+m}\right)$$

Test results for the 100 problems in "7.5.2 Inverse hyperbolic secant functions.m"

Problem 1: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 203 leaves, 8 steps) :

$$-\frac{(2+17\,a^2)\,\sqrt{\frac{1-a-b\,x}{1+a+b\,x}}\,(1+a+b\,x)}{12\,b^4}-\frac{x^2\,\sqrt{\frac{1-a-b\,x}{1+a+b\,x}}\,(1+a+b\,x)}{12\,b^2}+\frac{a\,(a+b\,x)\,\sqrt{\frac{1-a-b\,x}{1+a+b\,x}}\,(1+a+b\,x)}{3\,b^4}-$$

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

Result (type 3, 225 leaves):

$$-\frac{1}{12 b^4}\left(\sqrt{-\frac{-1+a+b x}{1+a+b x}}\left(2+2 a+13 a^2+13 a^3+\left(2-4 a+9 a^2\right) b x+(1-3 a) b^2 x^2+b^3 x^3\right)-3 b^4 x^4 \operatorname{ArcSech}[a+b x]-3 a^4 \operatorname{Log}[a+b x]+3 a^4 \operatorname{Log}\left[1+\sqrt{-\frac{-1+a+b x}{1+a+b x}}+a \sqrt{-\frac{-1+a+b x}{1+a+b x}}+b x \sqrt{-\frac{-1+a+b x}{1+a+b x}}\right]+6 i a\left(1+2 a^2\right) \operatorname{Log}\left[-2 i(a+b x)+2 \sqrt{-\frac{-1+a+b x}{1+a+b x}}(1+a+b x)\right]\right)$$

Problem 2: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 \operatorname{ArcSech}[a+b x] \, dx$$

Optimal (type 3, 153 leaves, 7 steps):

$$\frac{5 a \sqrt{\frac{1-a-b x}{1+a+b x}}(1+a+b x)}{6 b^3}-\frac{x \sqrt{\frac{1-a-b x}{1+a+b x}}(1+a+b x)}{6 b^2}+\frac{a^3 \operatorname{ArcSech}[a+b x]}{3 b^3}+\frac{1}{3} x^3 \operatorname{ArcSech}[a+b x]-\frac{\left(1+6 a^2\right) \operatorname{ArcTan}\left[\frac{\sqrt{\frac{1-a-b x}{1+a+b x}}(1+a+b x)}{a+b x}\right]}{6 b^3}$$

Result (type 3, 200 leaves):

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

Problem 3: Result unnecessarily involves imaginary or complex numbers.

$$\int x \operatorname{ArcSech}[a+b x] \, dx$$

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

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

Result (type 3, 176 leaves):

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

Problem 4: Result more than twice size of optimal antiderivative.

$$\int \text{ArcSech}[a+b\,x]\,dx$$

Optimal (type 3, 44 leaves, 4 steps):

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

Result (type 3, 105 leaves):

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

Problem 5: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 170 leaves, 14 steps):

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

Result (type 4, 332 leaves):

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

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

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

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

Problem 6: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{ArcSech}[a+b\,x]}{x^2}\,dx$$

Optimal (type 3, 70 leaves, 5 steps):

$$-\frac{b\,\mathrm{ArcSech}[a+b\,x]}{a}-\frac{\mathrm{ArcSech}[a+b\,x]}{x}+\frac{2\,b\,\mathrm{ArcTanh}\left[\frac{\sqrt{1+a}\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSech}[a+b\,x]\right]}{\sqrt{1-a}}\right]}{a\,\sqrt{1-a^2}}$$

Result (type 3, 244 leaves):

$$-\frac{\mathrm{ArcSech}[a+b\,x]}{x}+\frac{1}{a\,\sqrt{1-a^2}}b\left(-\mathrm{Log}[x]+\sqrt{1-a^2}\,\mathrm{Log}[a+b\,x]-\sqrt{1-a^2}\,\mathrm{Log}\left[1+\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}+a\,\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}+b\,x\,\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\right]+\right.$$

$$\left.\mathrm{Log}\left[1-a^2-a\,b\,x+\sqrt{1-a^2}\,\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}+a\,\sqrt{1-a^2}\,\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}+\sqrt{1-a^2}\,b\,x\,\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\right]\right)$$

Problem 7: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{ArcSech}[a+b\,x]}{x^3}\,dx$$

Optimal (type 3, 133 leaves, 7 steps):

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

Result (type 3, 315 leaves):

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

Problem 12: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 274 leaves, 17 steps):

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

Result (type 4, 778 leaves):

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

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

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

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

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

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

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

$$2\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\left[2,-\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{-1+\sqrt{1-a^2}}\right]+2\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\left[2,\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]+$$

$$\frac{1}{2}\,\mathrm{PolyLog}\left[3,-e^{-2\,\mathrm{ArcSech}[a+b\,x]}\right]-2\,\mathrm{PolyLog}\left[3,-\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{-1+\sqrt{1-a^2}}\right]-2\,\mathrm{PolyLog}\left[3,\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]$$

Problem 13: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\mathrm{ArcSech}[a+b\,x]^2}{x^2}\,dx$$

Optimal (type 4, 224 leaves, 12 steps):

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

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

Result (type 4, 678 leaves) :

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

$$\frac{1}{\sqrt{-1+a^2}}\,2\,b\left(2\,\text{ArcSech}[a+b\,x]\,\text{ArcTan}\left[\frac{(-1+a)\,\text{Coth}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]-2\,i\,\text{ArcCos}\left[\frac{1}{a}\right]\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]+\right.$$

$$\left(\text{ArcCos}\left[\frac{1}{a}\right]+2\left(\text{ArcTan}\left[\frac{(-1+a)\,\text{Coth}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]+\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right)\right)\text{Log}\Bigg[$$

$$\frac{\sqrt{-1+a^2}\;e^{-\frac{1}{2}\text{ArcSech}[a+b\,x]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{-\frac{b\,x}{a+b\,x}}}\Bigg]+\left(\text{ArcCos}\left[\frac{1}{a}\right]-2\left(\text{ArcTan}\left[\frac{(-1+a)\,\text{Coth}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]+\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right)\right)$$

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

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

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

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

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

Problem 14: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSech}[a+b\,x]^2}{x^3}\,dx$$

Optimal (type 4, 537 leaves, 23 steps):

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

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

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

Result (type 4, 1439 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\text{PolyLog}\left[2, \frac{\left(i+\sqrt{-1+a^2}\right)\left(-1+a-i\sqrt{-1+a^2}\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]\right)}{a\left(-i\,(-1+a)+\sqrt{-1+a^2}\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]\right)}\right]\Bigg)\Bigg)$$

Problem 17: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 378 leaves, 20 steps):

$$\text{ArcSech}[a+b\,x]^3\,\text{Log}\left[1-\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1-\sqrt{1-a^2}}\right]+\text{ArcSech}[a+b\,x]^3\,\text{Log}\left[1-\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]-\text{ArcSech}[a+b\,x]^3\,\text{Log}\left[1+e^{2\,\text{ArcSech}[a+b\,x]}\right]+$$
$$3\,\text{ArcSech}[a+b\,x]^2\,\text{PolyLog}\left[2,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1-\sqrt{1-a^2}}\right]+3\,\text{ArcSech}[a+b\,x]^2\,\text{PolyLog}\left[2,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]-$$
$$\frac{3}{2}\,\text{ArcSech}[a+b\,x]^2\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSech}[a+b\,x]}\right]-6\,\text{ArcSech}[a+b\,x]\,\text{PolyLog}\left[3,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1-\sqrt{1-a^2}}\right]-6\,\text{ArcSech}[a+b\,x]\,\text{PolyLog}\left[3,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]+$$
$$\frac{3}{2}\,\text{ArcSech}[a+b\,x]\,\text{PolyLog}\left[3,-e^{2\,\text{ArcSech}[a+b\,x]}\right]+6\,\text{PolyLog}\left[4,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1-\sqrt{1-a^2}}\right]+6\,\text{PolyLog}\left[4,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]-\frac{3}{4}\,\text{PolyLog}\left[4,-e^{2\,\text{ArcSech}[a+b\,x]}\right]$$

Result (type 4, 1025 leaves):

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

$$6\,i\,\mathrm{ArcSech}[a+b\,x]^2\,\mathrm{ArcSin}\Big[\frac{\sqrt{\frac{-1+a}{a}}}{\sqrt{2}}\Big]\,\mathrm{Log}\Big[1+\frac{\left(-1+\sqrt{1-a^2}\right)\left(1-\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\Big]-$$

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

$$6\,i\,\mathrm{ArcSech}[a+b\,x]^2\,\mathrm{ArcSin}\Big[\frac{\sqrt{\frac{-1+a}{a}}}{\sqrt{2}}\Big]\,\mathrm{Log}\Big[1+\frac{\left(1+\sqrt{1-a^2}\right)\left(-1+\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\Big]-$$

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

$$\frac{3}{2}\,\mathrm{ArcSech}[a+b\,x]^2\,\mathrm{PolyLog}\Big[2,-e^{-2\,\mathrm{ArcSech}[a+b\,x]}\Big]+3\,\mathrm{ArcSech}[a+b\,x]^2\,\mathrm{PolyLog}\Big[2,-\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{-1+\sqrt{1-a^2}}\Big]+$$

$$3\,\mathrm{ArcSech}[a+b\,x]^2\,\mathrm{PolyLog}\Big[2,\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\Big]+\frac{3}{2}\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\Big[3,-e^{-2\,\mathrm{ArcSech}[a+b\,x]}\Big]-$$

$$6\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\Big[3,-\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{-1+\sqrt{1-a^2}}\Big]-6\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\Big[3,\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\Big]+$$

$$\frac{3}{4}\,\mathrm{PolyLog}\Big[4,-e^{-2\,\mathrm{ArcSech}[a+b\,x]}\Big]+6\,\mathrm{PolyLog}\Big[4,-\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{-1+\sqrt{1-a^2}}\Big]+6\,\mathrm{PolyLog}\Big[4,\frac{a\,e^{\mathrm{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\Big]$$

Problem 18: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{ArcSech}[a+b\,x]^3}{x^2}\,dx$$

Optimal (type 4, 330 leaves, 14 steps):

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

$$\frac{3\,b\,\text{ArcSech}[a+b\,x]^2\,\text{Log}\left[1-\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1+\sqrt{1-a^2}}\right]}{a\,\sqrt{1-a^2}}+\frac{6\,b\,\text{ArcSech}[a+b\,x]\,\text{PolyLog}\left[2,\frac{a\,e^{\text{ArcSech}[a+b\,x]}}{1-\sqrt{1-a^2}}\right]}{a\,\sqrt{1-a^2}}-$$

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

Result (type 4, 1779 leaves) :

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

$$6\,b\,x\,\text{ArcCos}\left[-\frac{1}{a}\right]\,\text{ArcSech}[a+b\,x]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\,e^{-i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]+$$

$$12\,i\,b\,x\,\text{ArcSech}[a+b\,x]\,\text{ArcTanh}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSech}[a+b\,x]\right]\right]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\,e^{-i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]-$$

$$12\,i\,b\,x\,\text{ArcSech}[a+b\,x]\,\text{ArcTanh}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSech}[a+b\,x]\right]\right]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\,e^{-i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]-$$

$$6\,b\,x\,\text{ArcCos}\left[-\frac{1}{a}\right]\,\text{ArcSech}[a+b\,x]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\;e^{i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]-$$

$$12\,i\,b\,x\,\text{ArcSech}[a+b\,x]\,\text{ArcTanh}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]\right]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\;e^{i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]+$$

$$12\,i\,b\,x\,\text{ArcSech}[a+b\,x]\,\text{ArcTanh}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]\right]\,\text{Log}\left[\frac{\sqrt{-1+a^2}\;e^{i\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]}}{\sqrt{2}\,\sqrt{a}\,\sqrt{1+a\,\text{Cos}\left[2\,\text{ArcTan}\left[\frac{(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{\sqrt{-1+a^2}}\right]\right]}}\right]+$$

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

$$12\,i\,b\,x\,\text{ArcSech}[a+b\,x]\,\text{ArcTanh}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]\right]\,\text{Log}\left[\frac{\sqrt{-1+a^2}+i\,(1+a)\,\text{Tanh}\left[\frac{1}{2}\text{ArcSech}[a+b\,x]\right]}{2\,\sqrt{a}\,\sqrt{-\frac{(-1+a^2)\,(a+b\,x)}{b\,x}}\,\sqrt{-\frac{b\,x}{(-1+a)\,(1+a+b\,x)}}}\right]-$$

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

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

$$12\,\mathrm{i}\,b\,x\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{ArcTanh}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSech}[a+b\,x]\right]\right]\mathrm{Log}\left[-\frac{\mathrm{i}\left(-1+a^2\right)\sqrt{-\frac{b\,x}{(-1+a)\,(1+a+b\,x)}}}{\sqrt{a}\,\sqrt{-\frac{\left(-1+a^2\right)(a+b\,x)}{b\,x}}\left(-\mathrm{i}\,\sqrt{-1+a^2}+(1+a)\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSech}[a+b\,x]\right]\right)}\right]+$$

$$12\,\mathrm{i}\,b\,x\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{ArcTanh}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSech}[a+b\,x]\right]\right]\mathrm{Log}\left[-\frac{\mathrm{i}\left(-1+a^2\right)\sqrt{-\frac{b\,x}{(-1+a)\,(1+a+b\,x)}}}{\sqrt{a}\,\sqrt{-\frac{\left(-1+a^2\right)(a+b\,x)}{b\,x}}\left(-\mathrm{i}\,\sqrt{-1+a^2}+(1+a)\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSech}[a+b\,x]\right]\right)}\right]-$$

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

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

$$6\,\mathrm{i}\,b\,x\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\left[2,\frac{\left(1-\mathrm{i}\,\sqrt{-1+a^2}\right)\left(1-\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\right]+$$

$$6\,\mathrm{i}\,b\,x\,\mathrm{ArcSech}[a+b\,x]\,\mathrm{PolyLog}\left[2,\frac{\left(1+\mathrm{i}\,\sqrt{-1+a^2}\right)\left(1-\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\right]-$$

$$\left.6\,\mathrm{i}\,b\,x\,\mathrm{PolyLog}\left[3,\frac{\left(1-\mathrm{i}\,\sqrt{-1+a^2}\right)\left(1-\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\right]+6\,\mathrm{i}\,b\,x\,\mathrm{PolyLog}\left[3,\frac{\left(1+\mathrm{i}\,\sqrt{-1+a^2}\right)\left(1-\sqrt{-\frac{-1+a+b\,x}{1+a+b\,x}}\,(1+a+b\,x)\right)}{a\,(a+b\,x)}\right]\right)$$

Problem 19: Unable to integrate problem.

$$\int\frac{\mathrm{ArcSech}[a+b\,x]^3}{x^3}\,dx$$

Optimal (type 4, 965 leaves, 32 steps):

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

Result (type 8, 14 leaves):

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

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSech}[a x^n]}{x} \, dx$$

Optimal (type 4, 61 leaves, 7 steps):

$$\frac{\text{ArcSech}[a x^n]^2}{2 n}-\frac{\text{ArcSech}[a x^n] \text{Log}\left[1+e^{2 \text{ArcSech}[a x^n]}\right]}{n}-\frac{\text{PolyLog}\left[2,-e^{2 \text{ArcSech}[a x^n]}\right]}{2 n}$$

Result (type 4, 219 leaves):

$$\text{ArcSech}[a\,x^n]\,\text{Log}[x]+\frac{1}{8\,(n-a\,n\,x^n)}\sqrt{\frac{1-a\,x^n}{1+a\,x^n}}\left(4\sqrt{-1+a^2\,x^{2\,n}}\,\text{ArcTan}\left[\sqrt{-1+a^2\,x^{2\,n}}\right]\left(2\,n\,\text{Log}[x]-\text{Log}[a^2\,x^{2\,n}]\right)+\right.$$
$$\left.\sqrt{1-a^2\,x^{2\,n}}\left(\text{Log}[a^2\,x^{2\,n}]^2-4\,\text{Log}[a^2\,x^{2\,n}]\,\text{Log}\left[\frac{1}{2}\left(1+\sqrt{1-a^2\,x^{2\,n}}\right)\right]+2\,\text{Log}\left[\frac{1}{2}\left(1+\sqrt{1-a^2\,x^{2\,n}}\right)\right]^2-4\,\text{PolyLog}\left[2,\frac{1}{2}-\frac{1}{2}\sqrt{1-a^2\,x^{2\,n}}\right]\right)\right)$$

Problem 31: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 77 leaves, 7 steps):

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

Result (type 4, 249 leaves):

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

Problem 33: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a\,x]}\,x^3\,dx$$

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

$$\frac{x^3}{12\,a}+\frac{1}{4}\,e^{\text{ArcSech}[a\,x]}\,x^4-\frac{x\,\sqrt{1-a\,x}}{8\,a^3\,\sqrt{\frac{1}{1+a\,x}}}+\frac{\sqrt{\frac{1}{1+a\,x}}\,\sqrt{1+a\,x}\,\text{ArcSin}[a\,x]}{8\,a^4}$$

Result (type 3, 97 leaves):

$$\frac{8\,a^3\,x^3-3\,a\,\sqrt{\frac{1-a\,x}{1+a\,x}}\left(x+a\,x^2-2\,a^2\,x^3-2\,a^3\,x^4\right)+3\,i\,\text{Log}\left[-2\,i\,a\,x+2\,\sqrt{\frac{1-a\,x}{1+a\,x}}\,(1+a\,x)\right]}{24\,a^4}$$

Problem 35: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x]} x \, dx$$

Optimal (type 3, 53 leaves, 4 steps):

$$\frac{x}{2 a} + \frac{1}{2} e^{\text{ArcSech}[a x]} x^2 + \frac{\sqrt{\frac{1}{1+a x}} \sqrt{1 + a x} \, \text{ArcSin}[a x]}{2 a^2}$$

Result (type 3, 75 leaves):

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

Problem 36: Result more than twice size of optimal antiderivative.

$$\int e^{\text{ArcSech}[a x]} \, dx$$

Optimal (type 3, 24 leaves, 3 steps):

$$e^{\text{ArcSech}[a x]} x - \frac{\text{ArcSech}[a x]}{a} + \frac{\text{Log}[x]}{a}$$

Result (type 3, 79 leaves):

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

Problem 37: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e^{\text{ArcSech}[a x]}}{x} \, dx$$

Optimal (type 3, 48 leaves, 5 steps):

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

Result (type 3, 75 leaves) :

$$-\frac{1}{a x}+\left(-1-\frac{1}{a x}\right) \sqrt{\frac{1-a x}{1+a x}}-\mathrm{i} \operatorname{Log}\left[-2 \mathrm{i} a x+2 \sqrt{\frac{1-a x}{1+a x}}(1+a x)\right]$$

Problem 38: Result more than twice size of optimal antiderivative.

$$\int \frac{e^{\operatorname{ArcSech}[a x]}}{x^2} \, dx$$

Optimal (type 3, 35 leaves, 6 steps) :

$$-\frac{e^{\operatorname{ArcSech}[a x]}}{2 x}+a \operatorname{ArcTanh}\left[\sqrt{\frac{1-a x}{1+a x}}\right]$$

Result (type 3, 93 leaves) :

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

Problem 45: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\operatorname{ArcSech}[a x^2]} x^7 \, dx$$

Optimal (type 3, 111 leaves, 6 steps) :

$$\frac{x^6}{24 a}+\frac{1}{8} e^{\operatorname{ArcSech}[a x^2]} x^8-\frac{x^2 \sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \sqrt{1-a^2 x^4}}{16 a^3}+\frac{\sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \operatorname{ArcSin}[a x^2]}{16 a^4}$$

Result (type 3, 111 leaves) :

$$\frac{8 a^3 x^6-3 a \sqrt{\frac{1-a x^2}{1+a x^2}}\left(x^2+a x^4-2 a^2 x^6-2 a^3 x^8\right)+3 \mathrm{i} \operatorname{Log}\left[-2 \mathrm{i} a x^2+2 \sqrt{\frac{1-a x^2}{1+a x^2}}\left(1+a x^2\right)\right]}{48 a^4}$$

Problem 46: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x^2]} x^6 \, dx$$

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

$$\frac{2 x^5}{35 a} + \frac{1}{7} e^{\text{ArcSech}[a x^2]} x^7 - \frac{2 x \sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \sqrt{1-a^2 x^4}}{21 a^3} + \frac{2 \sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \, \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{a} \, x\right], -1\right]}{21 a^{7/2}}$$

Result (type 4, 139 leaves):

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

Problem 48: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x^2]} x^4 \, dx$$

Optimal (type 4, 112 leaves, 7 steps):

$$\frac{2 x^3}{15 a} + \frac{1}{5} e^{\text{ArcSech}[a x^2]} x^5 + \frac{2 \sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \, \text{EllipticE}\left[\text{ArcSin}\left[\sqrt{a} \, x\right], -1\right]}{5 a^{5/2}} - \frac{2 \sqrt{\frac{1}{1+a x^2}} \sqrt{1+a x^2} \, \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{a} \, x\right], -1\right]}{5 a^{5/2}}$$

Result (type 4, 140 leaves):

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

Problem 49: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x^2]} x^3 \, dx$$

Optimal (type 3, 63 leaves, 5 steps):

$$\frac{x^2}{4a}+\frac{1}{4}e^{\text{ArcSech}[a x^2]}x^4+\frac{\sqrt{\frac{1}{1+a x^2}}\sqrt{1+a x^2}\,\text{ArcSin}[a x^2]}{4a^2}$$

Result (type 3, 92 leaves):

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

Problem 50: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x^2]}x^2\,dx$$

Optimal (type 4, 67 leaves, 4 steps):

$$\frac{2x}{3a}+\frac{1}{3}e^{\text{ArcSech}[a x^2]}x^3+\frac{2\sqrt{\frac{1}{1+a x^2}}\sqrt{1+a x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{a}\,x\right],-1\right]}{3a^{3/2}}$$

Result (type 4, 116 leaves):

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

Problem 52: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{\text{ArcSech}[a x^2]}\,dx$$

Optimal (type 4, 147 leaves, 8 steps):

$$-\frac{2}{a x}+e^{\text{ArcSech}[a x^2]}x-\frac{2\sqrt{\frac{1}{1+a x^2}}\sqrt{1+a x^2}\sqrt{1-a^2x^4}}{a x}-$$
$$\frac{2\sqrt{\frac{1}{1+a x^2}}\sqrt{1+a x^2}\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{a}\,x\right],-1\right]}{\sqrt{a}}+\frac{2\sqrt{\frac{1}{1+a x^2}}\sqrt{1+a x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{a}\,x\right],-1\right]}{\sqrt{a}}$$

Result (type 4, 135 leaves):

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

Problem 54: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e^{\text{ArcSech}\left[a\,x^2\right]}}{x^2}\,dx$$

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

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

Result (type 4, 123 leaves):

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

Problem 58: Unable to integrate problem.

$$\int e^{\text{ArcSech}[a\,x]}\,x^m\,dx$$

Optimal (type 5, 91 leaves, 4 steps):

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

Result (type 8, 12 leaves):

$$\int e^{\text{ArcSech}[a\,x]}\,x^m\,dx$$

Problem 63: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e^{\text{ArcSech}\left[a\,x^p\right]}}{x}\,dx$$

Optimal (type 3, 87 leaves, 6 steps):

$$-\frac{x^{-p}}{a\,p}-\frac{x^{-p}\sqrt{1-a\,x^p}}{a\,p\sqrt{\frac{1}{1+a\,x^p}}}-\frac{\sqrt{\frac{1}{1+a\,x^p}}\sqrt{1+a\,x^p}\,\text{ArcSin}\left[a\,x^p\right]}{p}$$

Result (type 3, 96 leaves):

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

Problem 65: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{2\,\text{ArcSech}[a\,x]}\,x^4\,dx$$

Optimal (type 3, 203 leaves, 9 steps):

$$\frac{5\sqrt{\frac{1-a\,x}{1+a\,x}}\left(1+a\,x\right)^2}{4\,a^5}+\frac{\left(1-a\,x\right)\left(1+a\,x\right)^4}{5\,a^5}+\frac{\sqrt{\frac{1-a\,x}{1+a\,x}}\left(1+a\,x\right)^4\left(5-6\sqrt{\frac{1-a\,x}{1+a\,x}}\right)}{10\,a^5}+\frac{\left(1+a\,x\right)\left(4-\sqrt{\frac{1-a\,x}{1+a\,x}}\right)}{4\,a^5}-\frac{\left(1+a\,x\right)^3\left(4+45\sqrt{\frac{1-a\,x}{1+a\,x}}\right)}{30\,a^5}-\frac{\text{ArcTan}\left[\sqrt{\frac{1-a\,x}{1+a\,x}}\right]}{2\,a^5}$$

Result (type 3, 105 leaves):

$$\frac{40\,a^3\,x^3-12\,a^5\,x^5-15\,a\sqrt{\frac{1-a\,x}{1+a\,x}}\left(x+a\,x^2-2\,a^2\,x^3-2\,a^3\,x^4\right)+15\,i\,\text{Log}\left[-2\,i\,a\,x+2\sqrt{\frac{1-a\,x}{1+a\,x}}\left(1+a\,x\right)\right]}{60\,a^5}$$

Problem 67: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{2\,\text{ArcSech}[a\,x]}\,x^2\,dx$$

Optimal (type 3, 169 leaves, 7 steps):

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

Result (type 3, 86 leaves):

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

Problem 77: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{-\text{ArcSech}[a\,x]}\,x^3\,dx$$

Optimal (type 3, 163 leaves, 7 steps):

$$-\frac{\sqrt{\frac{1-ax}{1+ax}}\,(1+a\,x)^4}{4\,a^4}+\frac{(1+a\,x)\left(8+\sqrt{\frac{1-ax}{1+ax}}\right)}{8\,a^4}-\frac{(1+a\,x)^2\left(8+5\sqrt{\frac{1-ax}{1+ax}}\right)}{8\,a^4}+\frac{(1+a\,x)^3\left(4+9\sqrt{\frac{1-ax}{1+ax}}\right)}{12\,a^4}+\frac{\text{ArcTan}\left[\sqrt{\frac{1-ax}{1+ax}}\right]}{4\,a^4}$$

Result (type 3, 97 leaves):

$$\frac{8\,a^3x^3+3\,a\sqrt{\frac{1-ax}{1+ax}}\left(x+a\,x^2-2\,a^2x^3-2\,a^3x^4\right)-3\,i\,\text{Log}\left[-2\,i\,a\,x+2\sqrt{\frac{1-ax}{1+ax}}\,(1+a\,x)\right]}{24\,a^4}$$

Problem 79: Result unnecessarily involves imaginary or complex numbers.

$$\int e^{-\text{ArcSech}[a\,x]}\,x\,dx$$

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

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

Result (type 3, 75 leaves):

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

Problem 81: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e^{-\text{ArcSech}[a\,x]}}{x}\,dx$$

Optimal (type 3, 46 leaves, 5 steps):

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

Result (type 3, 74 leaves):

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

Problem 88: Unable to integrate problem.

$$\int \frac{e^{\text{ArcSech}[c x]} (d x)^m}{1-c^2 x^2} \, dx$$

Optimal (type 5, 89 leaves, 5 steps):

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

Result (type 8, 26 leaves):

$$\int \frac{e^{\text{ArcSech}[c x]} (d x)^m}{1-c^2 x^2} \, dx$$

Problem 90: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e^{\text{ArcSech}[c x]} x^3}{1-c^2 x^2} \, dx$$

Optimal (type 3, 75 leaves, 7 steps):

$$-\frac{x}{c^3}-\frac{x \sqrt{1-c x}}{2 c^3 \sqrt{\frac{1}{1+c x}}}+\frac{\sqrt{\frac{1}{1+c x}} \sqrt{1+c x} \text{ ArcSin}[c x]}{2 c^4}+\frac{\text{ArcTanh}[c x]}{c^4}$$

Result (type 3, 110 leaves):

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

Problem 92: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e^{\text{ArcSech}[c\,x]}\,x}{1-c^2\,x^2}\,dx$$

Optimal (type 3, 37 leaves, 5 steps):

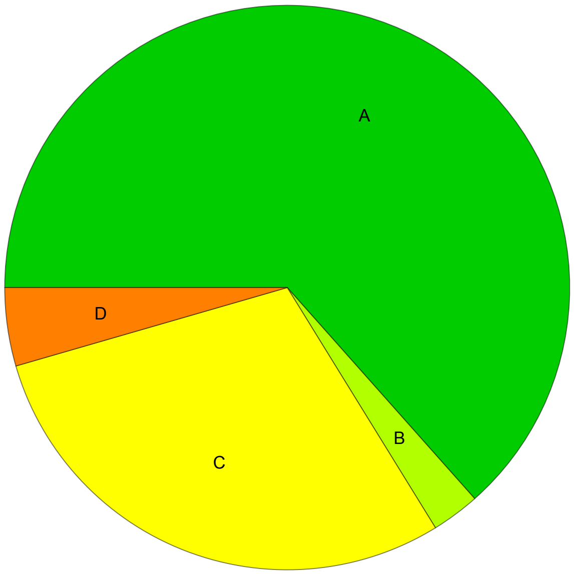
$$\frac{\sqrt{\frac{1}{1+c\,x}}\,\sqrt{1+c\,x}\,\text{ArcSin}[c\,x]}{c^2}+\frac{\text{ArcTanh}[c\,x]}{c^2}$$

Result (type 3, 68 leaves):

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

Summary of Integration Test Results

290 integration problems



A - 184 optimal antiderivatives

B - 8 more than twice size of optimal antiderivatives

C - 85 unnecessarily complex antiderivatives

D - 13 unable to integrate problems

E - 0 integration timeouts