Rubi 3 Test Suite Results

Algebraic Function Indefinite Integration Problems

Valid but unnecessarily complicated antiderivative:

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

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

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

Valid but unnecessarily complicated antiderivative:

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

$$\frac{(a-c)^2}{10 b \left(\sqrt{a+b x}+\sqrt{c+b x}\right)^5}-\frac{1}{2 b \left(\sqrt{a+b x}+\sqrt{c+b x}\right)}$$

$$-\frac{2 a\ (a+b x)^{3/2}}{5 b\ (a-c)^3}+\frac{2 c\ (a+b x)^{3/2}}{b\ (a-c)^3}+\frac{8 x\ (a+b x)^{3/2}}{5\ (a-c)^3}-\frac{2 a\ (c+b x)^{3/2}}{b\ (a-c)^3}+\frac{2 c\ (c+b x)^{3/2}}{5 b\ (a-c)^3}-\frac{8 x\ (c+b x)^{3/2}}{5\ (a-c)^3}$$

Valid but unnecessarily complicated antiderivative:

$$\left\{\frac{\sqrt{x}}{\sqrt{2-x}-\sqrt{x}},\ x,\ -37,\ 37\right\}$$

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

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

Valid but unnecessarily complicated antiderivative:

$$\left\{\frac{1}{\sqrt{1-x^2}\ \sqrt{-1+2 x^2}},\ x,\ -2,\ 2\right\}$$

$$-\text{EllipticF}[\text{ArcCos}[x],\ 2]$$

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

Unable to integrate:

$$\left\{\left(a+b x^2\right) \sqrt{2+d x^2} \sqrt{3+f x^2}, x, -5, 5\right\}$$

0

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

$$\frac{a (3 d-2 f) \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-f} x}{\sqrt{3}}\right], \frac{3 d}{2 f}\right]}{\sqrt{2} (-f)^{3/2}}+b \text{Int}\left[x^2 \sqrt{2+d x^2} \sqrt{3+f x^2}, x\right]$$

Unable to integrate:

$$\left\{\left(a+b x^2\right) \sqrt{c+d x^2} \sqrt{e+f x^2}, x, -7, 7\right\}$$

0

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

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

Unable to integrate:

$$\left\{\frac{x^4 \sqrt{-1+3 x^2}}{\sqrt{2-3 x^2}}, x, -1, 0\right\}$$

0

$$\text{Int}\left[\frac{x^4 \sqrt{-1+3 x^2}}{\sqrt{2-3 x^2}}, x\right]$$

Valid but unnecessarily complicated antiderivative:

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

$$-i \text{EllipticF}[i \text{ArcCosh}[x], 2]$$

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

Valid but unnecessarily complicated antiderivative:

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

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

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

$$\frac{2 a d \operatorname{ArcTanh}\left[\frac{a \sqrt{d}+b\left(\sqrt{d}\,x+\sqrt{c+d x^2}\right)}{\sqrt{b^2 c+a^2 d}}\right]}{b^2 \sqrt{b^2 c+a^2 d}}+\frac{\sqrt{d}\,\operatorname{Log}\left[\sqrt{d}\,x+\sqrt{c+d x^2}\right]}{b^2}$$

Valid but unnecessarily complicated antiderivative:

$$\left\{\frac{x\left(9-9 x+2 x^2\right)}{((-3+x)\,x)^{1/3}},\ x,\ -8,\ 8\right\}$$

$$\frac{3}{5}\,((-3+x)\,x)^{5/3}$$

$$-\frac{9}{5}\,x\left(-3 x+x^2\right)^{2/3}+\frac{3}{5}\,x^2\left(-3 x+x^2\right)^{2/3}$$

Unable to integrate:

$$\left\{\sqrt{9-6 x-44 x^2+15 x^3+3 x^4},\ x,\ -3,\ 3\right\}$$

$$-\frac{\sqrt{\frac{1}{613}\left(91-6 \sqrt{213}\right)}\,\sqrt{15-\sqrt{213}+\frac{2(-3+x)}{x^2}}\,\sqrt{15+\sqrt{213}+\frac{2(-3+x)}{x^2}}\,x^2 \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{6\left(-\frac{1}{6}+\frac{1}{x}\right)}{\sqrt{91-6 \sqrt{213}}}\right],\frac{-6552+432 \sqrt{213}}{-6552-432 \sqrt{213}}\right]}{\sqrt{9-6 x-44 x^2+15 x^3+3 x^4}}$$

$$-\frac{108 \sqrt{9-6 x-44 x^2+15 x^3+3 x^4}\ \operatorname{Subst}\left[\operatorname{Int}\left[\frac{\sqrt{794448-8491392 x^2+1679616 x^4}}{(-6-36 x)^2\,(1+6 x)^2},x\right],x,-\frac{1}{6}+\frac{1}{x}\right]}{x^2 \sqrt{\frac{9-6 x-44 x^2+15 x^3+3 x^4}{x^4}}}$$

Unable to integrate:

$$\left\{\frac{x}{\sqrt{-71-96 x+10 x^2+x^4}},\ x,\ -1,\ 0\right\}$$

$$-\frac{1}{8} \operatorname{Log}\left[-10001-3124 x^2+1408 x^3-54 x^4+128 x^5-20 x^6-x^8+\sqrt{-71-96 x+10 x^2+x^4}\left(781-528 x+27 x^2-80 x^3+15 x^4+x^6\right)\right]$$

$$\operatorname{Int}\left[\frac{x}{\sqrt{-71-96 x+10 x^2+x^4}},\ x\right]$$

Unable to integrate:

$$\left\{\frac{1}{\left(1+x^4\right)\sqrt{-x^2+\sqrt{1+x^4}}},\ x,\ -5,\ 5\right\}$$

$$\text{ArcCot}\left[\frac{\sqrt{-x^2+\sqrt{1+x^4}}}{x}\right]$$

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

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

Unable to integrate:

$$\left\{\sqrt{1+\frac{2x}{1+x^2}},x,-2,2\right\}$$

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

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

Unable to integrate:

$$\left\{\frac{\sqrt{1+\frac{2x}{1+x^2}}}{1+x^2},x,-2,2\right\}$$

$$-\frac{(1-x)\sqrt{\frac{(1+x)^2}{1+x^2}}}{1+x}$$

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

Unable to integrate:

$$\left\{\frac{1}{\sqrt{1+\frac{2x}{1+x^2}}},x,-2,2\right\}$$

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

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