Rubi 4.11 IntegrationTest Results

This file shows the integration problems for which ***Rubi*** either failed to get an antiderivative *or* returned a nonoptimal one. Each entry consists of the following items:

1. a phrase indicating the type of deficiency;
2. a list of the integrand, integration variable, number of rule applications desired, and number required;
3. the optimal antiderivative as contained in the test suite; and
4. the antiderivative as generated by ***Rubi***.

---

0 Independent test suites

```
IntegrationTest["0 Independent test suites\\Apostol Problems"];

Testing Rubi on 175 integration problems...

Test complete!

IntegrationTest["0 Independent test suites\\Moses Problems"];

Testing Rubi on 113 integration problems...

Test complete!

IntegrationTest["0 Independent test suites\\Timofeev Problems"];

Testing Rubi on 705 integration problems...

Problem #222: Valid but suboptimal antiderivative:
```

$$\left\{\frac{\sqrt{1-x}\;x\,(1+x)^{2/3}}{-(1-x)^{5/6}\,(1+x)^{1/3}+(1-x)^{2/3}\sqrt{1+x}},\,x,\,-49,\,49\right\}$$

$$-\frac{1}{12}(1-3x)(1-x)^{2/3}(1+x)^{1/3}+\frac{1}{4}\sqrt{1-x}\;x\sqrt{1+x}-\frac{1}{4}(1-x)(3+x)+\frac{1}{12}(1-x)^{1/3}(1+x)^{2/3}(1+3x)+\frac{1}{12}(1-x)^{1/6}(1+x)^{5/6}(2+3x)-$$

$$\frac{1}{12}(1-x)^{5/6}(1+x)^{1/6}(10+3x)+\frac{1}{6}\text{ArcTan}\left[\frac{(1+x)^{1/6}}{(1-x)^{1/6}}\right]-\frac{4\,\text{ArcTan}\left[\frac{(1-x)^{1/3}-2(1+x)^{1/3}}{\sqrt{3}\,(1-x)^{1/3}}\right]}{3\sqrt{3}}-\frac{5}{6}\text{ArcTan}\left[\frac{(1-x)^{1/3}-(1+x)^{1/3}}{(1-x)^{1/6}(1+x)^{1/6}}\right]+\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\,(1-x)^{1/6}(1+x)^{1/6}}{(1-x)^{1/3}+(1+x)^{1/3}}\right]}{6\sqrt{3}}$$

$$\frac{x}{2}+\frac{x^2}{4}-\frac{7}{12}(1-x)^{5/6}(1+x)^{1/6}+\frac{1}{6}(1-x)^{2/3}(1+x)^{1/3}-\frac{1}{4}(1-x)^{5/3}(1+x)^{1/3}+\frac{1}{4}\sqrt{1-x}\,x\sqrt{1+x}+\frac{1}{3}(1-x)^{1/3}(1+x)^{2/3}-\frac{1}{4}(1-x)^{4/3}(1+x)^{2/3}+\frac{5}{12}(1-x)^{1/6}(1+x)^{5/6}-$$

$$\frac{1}{4}(1-x)^{7/6}(1+x)^{5/6}-\frac{1}{4}(1-x)^{5/6}(1+x)^{7/6}+\frac{\text{ArcSin}[x]}{4}-\frac{2}{3}\text{ArcTan}\left[\frac{(1-x)^{1/6}}{(1+x)^{1/6}}\right]+\frac{2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2(1-x)^{1/3}}{\sqrt{3}(1+x)^{1/3}}\right]}{3\sqrt{3}}+\frac{1}{3}\text{ArcTan}\left[\sqrt{3}-\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}\right]-\frac{1}{3}\text{ArcTan}\left[\sqrt{3}+\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}\right]-$$

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

Problem #226: Valid but suboptimal antiderivative:

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

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

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

Problem #228: Valid but suboptimal antiderivative:

$$\left\{\frac{\left((-1+x)^2(1+x)\right)^{1/3}}{x^2},\,x,\,-6,\,6\right\}$$

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

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

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

Problem #232: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\left(9+3x-5x^2+x^3\right)^{1/3}},\,x,\,-2,\,2\right\}$$

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

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

Problem #288: Valid but suboptimal antiderivative:

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

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

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

Problem #306: Valid but suboptimal antiderivative:

$$\left\{\left(x\left(1-x^2\right)\right)^{1/3},\ x,\ -13,\ 13\right\}$$

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

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

Problem #401: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Tan}[x]}{\left(-1+\sqrt{\text{Tan}[x]}\ \right)^2},\ x,\ -21,\ 21\right\}$$

$$-\frac{x}{2}+\frac{\text{ArcTan}\left[\frac{1-\text{Tan}[x]}{\sqrt{2}\ \sqrt{\text{Tan}[x]}}\right]}{\sqrt{2}}+\frac{\text{ArcTanh}\left[\frac{1+\text{Tan}[x]}{\sqrt{2}\ \sqrt{\text{Tan}[x]}}\right]}{\sqrt{2}}+\frac{1}{2}\,\text{Log}[\text{Cos}[x]]+\text{Log}\left[1-\sqrt{\text{Tan}[x]}\ \right]+\frac{1}{1-\sqrt{\text{Tan}[x]}}$$

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

Problem #411: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[x]^3\,(\text{Cos}[2x]-3\,\text{Tan}[x])}{(\text{Sin}[x]^2-\text{Sin}[2x])\,\text{Sin}[2x]^{5/2}},\ x,\ -128,\ 128\right\}$$

$$\frac{33}{32}\,\text{ArcTanh}\left[\frac{1}{2}\,\text{Sec}[x]\,\sqrt{\text{Sin}[2x]}\,\right]-\frac{9\,\text{Cos}[x]}{16\,\sqrt{\text{Sin}[2x]}}-\frac{5\,\text{Cos}[x]\,\text{Cot}[x]}{24\,\sqrt{\text{Sin}[2x]}}+\frac{\text{Cos}[x]\,\text{Cot}[x]^2}{20\,\sqrt{\text{Sin}[2x]}}$$

$$-\left(33\,i\,\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticPi}\left[\frac{1}{2}\left(-1-\sqrt{5}\right),\,i\,\text{ArcSinh}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1+\text{Tan}\left[\frac{x}{2}\right]}\right)\Big/\left(32\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\left(33\,i\,\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticPi}\left[\frac{1}{2}\left(-1+\sqrt{5}\right),\,i\,\text{ArcSinh}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1+\text{Tan}\left[\frac{x}{2}\right]}\right)\Big/\left(32\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\frac{69\,\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{80\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}-\frac{9\left(2-\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{80\left(1-\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}+$$

$$\left(15\left(2-\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}\right)\Big/\left(8\left(3-\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}\right)+$$

$$\frac{3\left(3-\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{32\left(1-\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}-\frac{9\left(2+\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{80\left(1+\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}+$$

$$\left(15\left(2+\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}\right)\Big/\left(8\left(3+\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}\right)+$$

$$\frac{3\left(3+\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{32\left(1+\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}-$$

$$\frac{43\,\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{40\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}+\frac{\left(1-3\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}}{160\left(1-\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}}+$$

$$\left(11\left(2-\sqrt{5}\right)\text{Cos}\left[\frac{x}{2}\right]^2\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\,\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]^2}\right)\Big/\left(16\left(1-\sqrt{5}\right)\sqrt{\text{Cos}\left[\frac{x}{2}\right]^3\text{Sin}\left[\frac{x}{2}\right]\left(1-\text{Tan}\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\left(15\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}\right)\Big/\left(8\left(3-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\frac{3\left(3-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}}{32\left(1-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+$$

$$\left(11\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}\right)\Big/\left(16\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\left(15\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}\right)\Big/\left(8\left(3+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}\right)-$$

$$\frac{3\left(3+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}}{32\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{\left(1+3\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\tan\left[\frac{x}{2}\right]}\right],-1\right]\sqrt{\tan\left[\frac{x}{2}\right]}\,\sqrt{1-\tan\left[\frac{x}{2}\right]^2}}{160\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-$$

$$\frac{37\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{32\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-\frac{9\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{80\left(1-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{15\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{8\left(3-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+$$

$$\frac{3\left(3-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{32\left(1-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-\frac{9\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{80\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{15\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{8\left(3+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+$$

$$\frac{3\left(3+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{32\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{41\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{48\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{32\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-$$

$$\frac{11\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{16\left(1-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{32\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-\frac{11\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{16\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{16\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-$$

$$\frac{3\left(2-\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{80\left(1-\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}-\frac{3\left(2+\sqrt{5}\right)\cos\left[\frac{x}{2}\right]^2\cot\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{80\left(1+\sqrt{5}\right)\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{5\cos\left[\frac{x}{2}\right]\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{96\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}+\frac{\sin\left[\frac{x}{2}\right]^2\left(1-\tan\left[\frac{x}{2}\right]^2\right)}{160\sqrt{\cos\left[\frac{x}{2}\right]^3\sin\left[\frac{x}{2}\right]\left(1-\tan\left[\frac{x}{2}\right]^2\right)}}$$

Problem ⌗416: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[2\,x]-\sqrt{\text{Sin}[2\,x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}},\ x,\ -31,\ 31\right\}$$

$$-\sqrt{2}\ \text{Log}\left[\text{Cos}[x]+\text{Sin}[x]-\sqrt{2}\ \text{Sec}[x]\ \sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\ \right]-\frac{\text{ArcSin}[\text{Cos}[x]-\text{Sin}[x]]\ \text{Cos}[x]\ \sqrt{\text{Sin}[2\,x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}-\frac{\text{ArcTanh}[\text{Sin}[x]]\ \text{Cos}[x]\ \sqrt{\text{Sin}[2\,x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}-\frac{\text{Sin}[2\,x]}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}$$

$$-2\,\text{Sec}[x]^2\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\ -\sqrt{2}\ \text{ArcSinh}[\text{Tan}[x]]\ \text{Cot}[x]\ \left(\text{Sec}[x]^2\right)^{3/2}\sqrt{\text{Cos}[x]\,\text{Sin}[x]}\ \sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\ -\frac{\sqrt{2}\ \text{ArcTan}\left[1-\sqrt{2}\ \sqrt{\text{Tan}[x]}\ \right]\text{Sec}[x]^2\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}{\sqrt{\text{Tan}[x]}}+$$

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

Problem #427: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[3\,x]}{-\sqrt{-1+8\,\text{Cos}[x]^2}\ +\sqrt{3\,\text{Cos}[x]^2-\text{Sin}[x]^2}},\ x,\ -51,\ 51\right\}$$

$$\frac{5\,\text{ArcSin}\left[2\,\sqrt{\frac{2}{7}}\ \text{Sin}[x]\right]}{4\,\sqrt{2}}+\frac{3}{4}\,\text{ArcSin}\left[\frac{2\,\text{Sin}[x]}{\sqrt{3}}\right]-\frac{3}{4}\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{-1+4\,\text{Cos}[x]^2}}\right]-\frac{3}{4}\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{-1+8\,\text{Cos}[x]^2}}\right]-\frac{1}{2}\,\sqrt{-1+4\,\text{Cos}[x]^2}\ \text{Sin}[x]-\frac{1}{2}\,\sqrt{-1+8\,\text{Cos}[x]^2}\ \text{Sin}[x]$$

$$\frac{5\,\text{ArcSin}\left[2\,\sqrt{\frac{2}{7}}\ \text{Sin}[x]\right]}{4\,\sqrt{2}}+\frac{3}{4}\,\text{ArcSin}\left[\frac{2\,\text{Sin}[x]}{\sqrt{3}}\right]+\frac{3}{8}\,\text{ArcTan}\left[\frac{7-8\,\text{Sin}[x]}{\sqrt{7-8\,\text{Sin}[x]^2}}\right]-\frac{3}{8}\,\text{ArcTan}\left[\frac{7+8\,\text{Sin}[x]}{\sqrt{7-8\,\text{Sin}[x]^2}}\right]+$$

$$\frac{3}{8}\,\text{ArcTan}\left[\frac{3-4\,\text{Sin}[x]}{\sqrt{3-4\,\text{Sin}[x]^2}}\right]-\frac{3}{8}\,\text{ArcTan}\left[\frac{3+4\,\text{Sin}[x]}{\sqrt{3-4\,\text{Sin}[x]^2}}\right]-\frac{1}{2}\,\text{Sin}[x]\,\sqrt{7-8\,\text{Sin}[x]^2}\ -\frac{1}{2}\,\text{Sin}[x]\,\sqrt{3-4\,\text{Sin}[x]^2}$$

Problem #447: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Sec}[x]^2\left(-\text{Cos}[2\,x]+2\,\text{Tan}[x]^2\right)}{\left(\text{Tan}[x]\ \text{Tan}[2\,x]\right)^{3/2}},\ x,\ -20,\ 20\right\}$$

$$2\,\text{ArcTanh}\left[\frac{\text{Tan}[x]}{\sqrt{\text{Tan}[x]\ \text{Tan}[2\,x]}}\right]-\frac{11\,\text{ArcTanh}\left[\frac{\sqrt{2}\ \text{Tan}[x]}{\sqrt{\text{Tan}[x]\ \text{Tan}[2\,x]}}\right]}{4\,\sqrt{2}}+\frac{\text{Tan}[x]}{2\,\left(\text{Tan}[x]\ \text{Tan}[2\,x]\right)^{3/2}}+\frac{2\,\text{Tan}[x]^3}{3\,\left(\text{Tan}[x]\ \text{Tan}[2\,x]\right)^{3/2}}+\frac{3\,\text{Tan}[x]}{4\,\sqrt{\text{Tan}[x]\ \text{Tan}[2\,x]}}$$

$$\frac{3\,\text{Tan}[x]}{4\,\sqrt{2}\ \sqrt{\frac{\text{Tan}[x]^2}{1-\text{Tan}[x]^2}}}+\frac{\text{Cot}[x]\ \left(1-\text{Tan}[x]^2\right)}{4\,\sqrt{2}\ \sqrt{\frac{\text{Tan}[x]^2}{1-\text{Tan}[x]^2}}}+\frac{\text{Tan}[x]\ \left(1-\text{Tan}[x]^2\right)}{3\,\sqrt{2}\ \sqrt{\frac{\text{Tan}[x]^2}{1-\text{Tan}[x]^2}}}-\frac{11\,\text{ArcTan}\left[\sqrt{-1+\text{Tan}[x]^2}\ \right]\text{Tan}[x]}{4\,\sqrt{2}\ \sqrt{\frac{\text{Tan}[x]^2}{1-\text{Tan}[x]^2}}\ \sqrt{-1+\text{Tan}[x]^2}}+\frac{2\,\text{ArcTan}\left[\frac{\sqrt{-1+\text{Tan}[x]^2}}{\sqrt{2}}\right]\text{Tan}[x]}{\sqrt{\frac{\text{Tan}[x]^2}{1-\text{Tan}[x]^2}}\ \sqrt{-1+\text{Tan}[x]^2}}$$

Problem #455: Valid but suboptimal antiderivative:

$$\left\{\frac{\sin[x]^6 \tan[x]}{\cos[2x]^{3/4}}, x, -16, 16\right\}$$

$$\frac{\text{ArcTan}\left[\frac{1-\sqrt{\cos[2x]}}{\sqrt{2}\,\cos[2x]^{1/4}}\right]}{\sqrt{2}} - \frac{\text{ArcTanh}\left[\frac{1+\sqrt{\cos[2x]}}{\sqrt{2}\,\cos[2x]^{1/4}}\right]}{\sqrt{2}} + \frac{71}{45}\cos[2x]^{1/4} + \frac{13}{45}\cos[2x]^{1/4}\sin[x]^2 + \frac{1}{9}\cos[2x]^{1/4}\sin[x]^4$$

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

$$\frac{1}{36}\left(-1+2\cos[x]^2\right)^{9/4} + \frac{\text{Log}\left[1-\sqrt{2}\,\left(-1+2\cos[x]^2\right)^{1/4}+\sqrt{-1+2\cos[x]^2}\right]}{2\sqrt{2}} - \frac{\text{Log}\left[1+\sqrt{2}\,\left(-1+2\cos[x]^2\right)^{1/4}+\sqrt{-1+2\cos[x]^2}\right]}{2\sqrt{2}}$$

Problem #456: Valid but suboptimal antiderivative:

$$\left\{\sqrt{\tan[x]\tan[2x]}, x, -6, 6\right\}$$

$$-\text{ArcTanh}\left[\frac{\tan[x]}{\sqrt{\tan[x]\tan[2x]}}\right]$$

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

Problem #493: Unable to integrate:

$$\left\{\frac{x^2}{(x\cos[x]-\sin[x])^2}, x, -1, 0\right\}$$

$$\frac{\cos[x]+x\sin[x]}{x\cos[x]-\sin[x]}$$

$$\text{Int}\left[\frac{x^2}{(x\cos[x]-\sin[x])^2}, x\right]$$

Problem #567: Valid but suboptimal antiderivative:

$$\left\{e^{x/2}x^2\cos[x]^3, x, -31, 31\right\}$$

$$-\frac{132}{125}e^{x/2}\cos[x] + \frac{18}{25}e^{x/2}x\cos[x] + \frac{48}{185}e^{x/2}x^2\cos[x] + \frac{2}{37}e^{x/2}x^2\cos[x]^3 - \frac{428\,e^{x/2}\cos[3x]}{50\,653} + \frac{70\,e^{x/2}x\cos[3x]}{1369} -$$

$$\frac{24}{125}e^{x/2}\sin[x] - \frac{24}{25}e^{x/2}x\sin[x] + \frac{96}{185}e^{x/2}x^2\sin[x] + \frac{12}{37}e^{x/2}x^2\cos[x]^2\sin[x] - \frac{792\,e^{x/2}\sin[3x]}{50\,653} - \frac{24\,e^{x/2}x\sin[3x]}{1369}$$

$$-\frac{6\,687\,696\,e^{x/2}\,\text{Cos}[x]}{6\,331\,625}+\frac{24\,792\,e^{x/2}\,x\,\text{Cos}[x]}{34\,225}+\frac{48}{185}e^{x/2}\,x^2\,\text{Cos}[x]+\frac{16\,e^{x/2}\,\text{Cos}[x]^3}{50\,653}-\frac{8\,e^{x/2}\,x\,\text{Cos}[x]^3}{1369}+\frac{2}{37}e^{x/2}\,x^2\,\text{Cos}[x]^3-\frac{432\,e^{x/2}\,\text{Cos}[3\,x]}{50\,653}+\frac{72\,e^{x/2}\,x\,\text{Cos}[3\,x]}{1369}-\frac{1\,218\,672\,e^{x/2}\,\text{Sin}[x]}{6\,331\,625}-\frac{32\,556\,e^{x/2}\,x\,\text{Sin}[x]}{34\,225}+\frac{96}{185}e^{x/2}\,x^2\,\text{Sin}[x]+\frac{96\,e^{x/2}\,\text{Cos}[x]^2\,\text{Sin}[x]}{50\,653}-\frac{48\,e^{x/2}\,x\,\text{Cos}[x]^2\,\text{Sin}[x]}{1369}+\frac{12}{37}e^{x/2}\,x^2\,\text{Cos}[x]^2\,\text{Sin}[x]-\frac{816\,e^{x/2}\,\text{Sin}[3\,x]}{50\,653}-\frac{12\,e^{x/2}\,x\,\text{Sin}[3\,x]}{1369}$$

Problem #592: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cosh}[x]\,(-\text{Cosh}[2\,x]+\text{Tanh}[x])}{\sqrt{\text{Sinh}[2\,x]}\,\left(\text{Sinh}[x]^2+\text{Sinh}[2\,x]\right)},\,x,\,-52,\,52\right\}$$

$$\sqrt{2}\,\text{ArcTan}\left[\text{Sech}[x]\,\sqrt{\text{Cosh}[x]\,\text{Sinh}[x]}\,\right]+\frac{1}{6}\text{ArcTan}\left[\frac{\text{Sinh}[x]}{\sqrt{\text{Sinh}[2\,x]}}\right]-\frac{1}{3}\sqrt{2}\,\text{ArcTanh}\left[\text{Sech}[x]\,\sqrt{\text{Cosh}[x]\,\text{Sinh}[x]}\,\right]+\frac{\text{Cosh}[x]}{\sqrt{\text{Sinh}[2\,x]}}$$

$$\left((-1)^{1/4}\,\text{Cosh}\left[\frac{x}{2}\right]^2\,\text{EllipticPi}\left[\frac{2}{i-\sqrt{3}},\,-\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{i\,\text{Sinh}[2\,x]}\,\sqrt{-i\left(i-\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\sqrt{-i\left(i+\text{Tanh}\left[\frac{x}{2}\right]\right)}\right)\Big/\left(\sqrt{\text{Sinh}[2\,x]}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\,\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)+$$

$$\left((-1)^{1/4}\,\text{Cosh}\left[\frac{x}{2}\right]^2\,\text{EllipticPi}\left[\frac{2}{i+\sqrt{3}},\,-\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\sqrt{i\,\text{Sinh}[2\,x]}\,\sqrt{-i\left(i-\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\sqrt{-i\left(i+\text{Tanh}\left[\frac{x}{2}\right]\right)}\right)\Big/\left(\sqrt{\text{Sinh}[2\,x]}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\,\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)-\frac{i\,\text{Csch}\left[\frac{x}{2}\right]\,\text{Sech}\left[\frac{x}{2}\right]\sqrt{i\,\text{Sinh}[2\,x]}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\,\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}}{2\sqrt{\text{Sinh}[2\,x]}}-$$

$$\left(4\,(-1)^{3/4}\,\text{EllipticPi}\left[-i,\,-\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{i\,\text{Sinh}[2\,x]}\,\sqrt{-i\left(i-\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{-i\left(i+\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\,\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)\Big/\left(\sqrt{\text{Sinh}[2\,x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)+$$

$$\left(4\,(-1)^{3/4}\,\text{EllipticPi}\left[i,\,-\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{i\,\text{Sinh}[2\,x]}\,\sqrt{-i\left(i-\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{-i\left(i+\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\,\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)\Big/\left(3\sqrt{\text{Sinh}[2\,x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)+$$

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

$$\left(5\,(-1)^{3/4}\,\text{EllipticPi}\left[\frac{2}{i+\sqrt{3}},\,-\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,-1\right]\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{i\,\text{Sinh}[2x]}\,\sqrt{-i\left(i-\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{-i\left(i+\text{Tanh}\left[\frac{x}{2}\right]\right)}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)\Big/$$

$$\left(6\sqrt{\text{Sinh}[2x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)-$$

$$\left(\text{Cosh}\left[\frac{x}{2}\right]^2\text{EllipticF}\left[2\,\text{ArcTan}\left[\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,\frac{1}{2}\right]\sqrt{i\,\text{Sinh}[2x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)\sqrt{\frac{1+\text{Tanh}\left[\frac{x}{2}\right]^2}{\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)^2}}\right)\Big/\left(2\sqrt{\text{Sinh}[2x]}\,\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\right)+$$

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

$$\left(5\left(3\,i-\sqrt{3}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,\frac{1}{2}\right]\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{i\,\text{Sinh}[2x]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\,\sqrt{\frac{1+\text{Tanh}\left[\frac{x}{2}\right]^2}{\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)^2}}\right)\Big/$$

$$\left(24\sqrt{\text{Sinh}[2x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)-$$

$$\left(5\left(3\,i+\sqrt{3}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\right],\,\frac{1}{2}\right]\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{i\,\text{Sinh}[2x]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)\sqrt{i\,\text{Cosh}\left[\frac{x}{2}\right]^3\text{Sinh}\left[\frac{x}{2}\right]\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)}\,\sqrt{\frac{1+\text{Tanh}\left[\frac{x}{2}\right]^2}{\left(1+\text{Tanh}\left[\frac{x}{2}\right]\right)^2}}\right)\Big/$$

$$\left(24\sqrt{\text{Sinh}[2x]}\,\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)$$

Problem ⌗695: Valid but suboptimal antiderivative:

$$\left\{\text{ArcSin}\left[\sqrt{\frac{-a+x}{a+x}}\,\right],\,x,\,-8,\,8\right\}$$

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

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

Problem #705: Valid but suboptimal antiderivative:

$$\{e^x\,\text{ArcSin}[\text{Tanh}[x]],\,x,\,-5,\,5\}$$

$$e^x\,\text{ArcSin}[\text{Tanh}[x]]-\text{Cosh}[x]\,\text{Log}\left[1+e^{2x}\right]\sqrt{\text{Sech}[x]^2}$$

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

Test complete!

IntegrationTest["0 Independent test suites\\Charlwood Problems"];

Testing Rubi on 50 integration problems...

Problem #3: Unable to integrate:

$$\left\{-\text{ArcSin}\left[\sqrt{x}-\sqrt{1+x}\,\right],\,x,\,-3,\,3\right\}$$

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

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

Problem #4: Valid but suboptimal antiderivative:

$$\left\{\text{Log}\left[1+x\sqrt{1+x^2}\,\right],\,x,\,-32,\,32\right\}$$

$$-2\,x+\sqrt{2\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{-2+\sqrt{5}}\,\left(x+\sqrt{1+x^2}\right)\right]-\sqrt{2\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{2+\sqrt{5}}\,\left(x+\sqrt{1+x^2}\right)\right]+x\,\text{Log}\left[1+x\sqrt{1+x^2}\,\right]$$

$$-2x-\sqrt{\frac{1}{10}\left(1+\sqrt{5}\right)}\ \text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ x\right]+2\sqrt{\frac{1}{5}\left(2+\sqrt{5}\right)}\ \text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ x\right]+\sqrt{\frac{2}{5\left(-1+\sqrt{5}\right)}}\ \text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ \sqrt{1+x^2}\ \right]+$$

$$\sqrt{\frac{2}{5}\left(-1+\sqrt{5}\right)}\ \text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ \sqrt{1+x^2}\ \right]+2\sqrt{\frac{1}{5}\left(-2+\sqrt{5}\right)}\ \text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ x\right]+\sqrt{\frac{1}{10}\left(-1+\sqrt{5}\right)}\ \text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ x\right]+$$

$$\sqrt{\frac{2}{5\left(1+\sqrt{5}\right)}}\ \text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ \sqrt{1+x^2}\ \right]-\sqrt{\frac{2}{5}\left(1+\sqrt{5}\right)}\ \text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ \sqrt{1+x^2}\ \right]+x\,\text{Log}\left[1+x\sqrt{1+x^2}\ \right]$$

Problem #5: NOT valid or unverifable antiderivative:

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

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

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

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

$$\left(3^{1/4}\left(1+\sqrt{3}\right)\text{Cos}[x]^2\,\text{EllipticPi}\left[\frac{1}{6}\left(3-2\sqrt{3}\right),\ 2\,\text{ArcTan}\left[\frac{\text{Tan}[x]}{3^{1/4}}\right],\ \frac{1}{4}\left(2-\sqrt{3}\right)\right]\left(\sqrt{3}+\text{Tan}[x]^2\right)\sqrt{\frac{3+3\,\text{Tan}[x]^2+\text{Tan}[x]^4}{\left(\sqrt{3}+\text{Tan}[x]^2\right)^2}}\right)\Big/\left(4\left(3-\sqrt{3}\right)\sqrt{\text{Cos}[x]^4\left(3+3\,\text{Tan}[x]^2+\text{Tan}[x]^4\right)}\right)$$

Problem #12: Valid but suboptimal antiderivative:

$$\left\{\text{ArcTan}\left[x+\sqrt{1-x^2}\ \right],\ x,\ -44,\ 44\right\}$$

$$-\frac{\text{ArcSin}[x]}{2}+\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{-1+\sqrt{3}\ x}{\sqrt{1-x^2}}\right]+\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{1+\sqrt{3}\ x}{\sqrt{1-x^2}}\right]-\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{-1+2\,x^2}{\sqrt{3}}\right]+x\,\text{ArcTan}\left[x+\sqrt{1-x^2}\ \right]-\frac{1}{4}\text{ArcTanh}\left[x\sqrt{1-x^2}\ \right]-\frac{1}{8}\text{Log}\left[1-x^2+x^4\right]$$

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

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

Problem #13: Valid but suboptimal antiderivative:

$$\left\{\frac{x\,\text{ArcTan}\left[x+\sqrt{1-x^2}\right]}{\sqrt{1-x^2}},\ x,\ -33,\ 33\right\}$$

$$-\frac{\text{ArcSin}[x]}{2}+\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{-1+\sqrt{3}\ x}{\sqrt{1-x^2}}\right]+\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{1+\sqrt{3}\ x}{\sqrt{1-x^2}}\right]-\frac{1}{4}\sqrt{3}\ \text{ArcTan}\left[\frac{-1+2x^2}{\sqrt{3}}\right]-\sqrt{1-x^2}\ \text{ArcTan}\left[x+\sqrt{1-x^2}\right]+\frac{1}{4}\text{ArcTanh}\left[x\sqrt{1-x^2}\right]+\frac{1}{8}\text{Log}\left[1-x^2+x^4\right]$$

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

$$\frac{\text{ArcTan}\left[\frac{\sqrt{-\frac{i-\sqrt{3}}{i+\sqrt{3}}}\ x}{\sqrt{1-x^2}}\right]}{2\sqrt{3}}+\frac{1}{12}\left(3i+\sqrt{3}\right)\text{ArcTan}\left[\frac{\sqrt{-\frac{i-\sqrt{3}}{i+\sqrt{3}}}\ x}{\sqrt{1-x^2}}\right]-\sqrt{1-x^2}\ \text{ArcTan}\left[x+\sqrt{1-x^2}\right]+\frac{1}{8}\text{Log}\left[1-x^2+x^4\right]$$

Problem #42: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Sec}[x]}{\sqrt{-1+\text{Sec}[x]^4}},\ x,\ -6,\ 6\right\}$$

$$-\frac{\text{ArcTanh}\left[\frac{\text{Cos}[x]\ \text{Cot}[x]\ \sqrt{-1+\text{Sec}[x]^4}}{\sqrt{2}}\right]}{\sqrt{2}}$$

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{2}\ \text{Sin}[x]}{\sqrt{2\,\text{Sin}[x]^2-\text{Sin}[x]^4}}\right]\sqrt{1-\text{Cos}[x]^4}\ \text{Sec}[x]^2}{\sqrt{2}\ \sqrt{-1+\text{Sec}[x]^4}}$$

Problem #44: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Sin}[x]}{\sqrt{1-\text{Sin}[x]^6}},\ x,\ -5,\ 5\right\}$$

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\ \text{Cos}[x]\ \left(1+\text{Sin}[x]^2\right)}{2\sqrt{1-\text{Sin}[x]^6}}\right]}{2\sqrt{3}}$$

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\ \left(2-\text{Cos}[x]^2\right)}{2\sqrt{3-3\,\text{Cos}[x]^2+\text{Cos}[x]^4}}\right]\text{Cos}[x]\sqrt{3-3\,\text{Cos}[x]^2+\text{Cos}[x]^4}}{2\sqrt{3}\ \sqrt{3\,\text{Cos}[x]^2-3\,\text{Cos}[x]^4+\text{Cos}[x]^6}}$$

Problem #45: Unable to integrate:

$$\left\{\sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}},\ x,\ -1,\ 0\right\}$$

$$\sqrt{2}\left(\sqrt{-1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{-2+2\sqrt{2}}\ \left(-\sqrt{2}-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}\right)}{2\sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}}\right]-\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2+2\sqrt{2}}\ \left(-\sqrt{2}-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}\right)}{2\sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}}\right]-\right.$$
$$\left.\sqrt{1+\sqrt{2}}\ \text{ArcTanh}\left[\frac{\sqrt{-2+2\sqrt{2}}\ \sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}}{\sqrt{2}-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}\right]+\sqrt{-1+\sqrt{2}}\ \text{ArcTanh}\left[\frac{\sqrt{2+2\sqrt{2}}\ \sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}}{\sqrt{2}-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}}\right]\right)\text{Cot}[x]\sqrt{-1+\text{Sec}[x]}\ \sqrt{1+\text{Sec}[x]}$$

$$\text{Int}\left[\sqrt{-\sqrt{-1+\text{Sec}[x]}+\sqrt{1+\text{Sec}[x]}},\ x\right]$$

Test complete!

IntegrationTest["0 Independent test suites\\Stewart Problems"];

Testing Rubi on 376 integration problems...

Test complete!

IntegrationTest["0 Independent test suites\\Hearn Problems"];

Testing Rubi on 284 integration problems...

Problem #169: Unable to integrate:

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

$$-\frac{e^{1-e^{x^2}\,x}}{-1+e^{x^2}x}$$

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

Problem #201: Unable to integrate:

$$\left\{\frac{-2\sqrt{1+x^3}+5x^4\sqrt{1+x^3}-3x^2\sqrt{1-2x+x^5}}{2\sqrt{1+x^3}\ \sqrt{1-2x+x^5}},\ x,\ -4,\ 4\right\}$$

$$-\sqrt{1+x^3}+\sqrt{1-2x+x^5}$$

$$-\sqrt{1+x^3}-\text{Int}\left[\frac{1}{\sqrt{1-2x+x^5}},\ x\right]+\frac{5}{2}\,\text{Int}\left[\frac{x^4}{\sqrt{1-2x+x^5}},\ x\right]$$

Problem #274: Unable to integrate:

$$\left\{\frac{e^{x^2}}{x}+2e^{x^2}x\,\text{Log}[x]+\frac{-2+\text{Log}[x]}{\left(x+\text{Log}[x]^2\right)^2}+\frac{1+\frac{1}{x}+\frac{2\,\text{Log}[x]}{x}}{x+\text{Log}[x]^2},\ x,\ -9,\ 9\right\}$$

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

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

Problem #278: Unable to integrate:

$$\left\{\frac{-8-8x-x^2-3x^3+7x^4+4x^5+2x^6}{\left(-1+2x^2\right)^2\sqrt{1+2x^2+4x^3+x^4}},\ x,\ -10,\ 10\right\}$$

$$\frac{(1+2x)\sqrt{1+2x^2+4x^3+x^4}}{2\left(-1+2x^2\right)}-\text{ArcTanh}\left[\frac{x\,(2+x)\left(7-x+27x^2+33x^3\right)}{\left(2+37x^2+31x^3\right)\sqrt{1+2x^2+4x^3+x^4}}\right]$$

$$\frac{9}{4}\,\text{Int}\left[\frac{1}{\sqrt{1+2x^2+4x^3+x^4}},x\right]-\frac{13}{4}\,\text{Int}\left[\frac{1}{\left(\sqrt{2}-2x\right)^2\sqrt{1+2x^2+4x^3+x^4}},x\right]+\text{Int}\left[\frac{x}{\sqrt{1+2x^2+4x^3+x^4}},x\right]+\frac{1}{2}\,\text{Int}\left[\frac{x^2}{\sqrt{1+2x^2+4x^3+x^4}},x\right]-$$
$$\frac{13}{4}\,\text{Int}\left[\frac{1}{\left(\sqrt{2}+2x\right)^2\sqrt{1+2x^2+4x^3+x^4}},x\right]-\frac{13}{8}\,\text{Int}\left[\frac{1}{\left(1-\sqrt{2}\,x\right)\sqrt{1+2x^2+4x^3+x^4}},x\right]-\frac{1}{8}\left(15+\sqrt{2}\right)\text{Int}\left[\frac{1}{\left(1-\sqrt{2}\,x\right)\sqrt{1+2x^2+4x^3+x^4}},x\right]-$$
$$\frac{13}{8}\,\text{Int}\left[\frac{1}{\left(1+\sqrt{2}\,x\right)\sqrt{1+2x^2+4x^3+x^4}},x\right]-\frac{1}{8}\left(15-\sqrt{2}\right)\text{Int}\left[\frac{1}{\left(1+\sqrt{2}\,x\right)\sqrt{1+2x^2+4x^3+x^4}},x\right]-\frac{17}{2}\,\text{Int}\left[\frac{x}{\left(-1+2x^2\right)^2\sqrt{1+2x^2+4x^3+x^4}},x\right]$$

Problem #279: Unable to integrate:

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

$$-\frac{1}{4}\,\text{ArcTanh}\left[\frac{(1-3y)\sqrt{1-5y-5y^2}}{(1-5y)\sqrt{1-y-y^2}}\right]-\frac{1}{2}\,\text{ArcTanh}\left[\frac{(4+3y)\sqrt{1-5y-5y^2}}{(6+5y)\sqrt{1-y-y^2}}\right]+\frac{9}{4}\,\text{ArcTanh}\left[\frac{(11+7y)\sqrt{1-5y-5y^2}}{3(7+5y)\sqrt{1-y-y^2}}\right]$$

$$\frac{1}{2}\,\text{Int}\left[\frac{\sqrt{1-5y-5y^2}}{y\sqrt{1-y-y^2}},y\right]+\text{Int}\left[\frac{\sqrt{1-5y-5y^2}}{(1+y)\sqrt{1-y-y^2}},y\right]-\frac{3}{2}\,\text{Int}\left[\frac{\sqrt{1-5y-5y^2}}{(2+y)\sqrt{1-y-y^2}},y\right]$$

Problem #284: Unable to integrate:

$$\left\{\frac{3+3x-4x^2-4x^3-7x^6+4x^7+10x^8+7x^{13}}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x,-2,2\right\}$$

$$\frac{1}{2}\left(\left(1+\sqrt{2}\right)\text{Log}\left[1+x+\sqrt{2}\,x+\sqrt{2}\,x^2-x^7\right]-\left(-1+\sqrt{2}\right)\text{Log}\left[-1+\left(-1+\sqrt{2}\right)x+\sqrt{2}\,x^2+x^7\right]\right)$$

$$3\,\text{Int}\left[\frac{1}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]+3\,\text{Int}\left[\frac{x}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]-$$
$$4\,\text{Int}\left[\frac{x^2}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]-4\,\text{Int}\left[\frac{x^3}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]-7\,\text{Int}\left[\frac{x^6}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]+$$
$$4\,\text{Int}\left[\frac{x^7}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]+10\,\text{Int}\left[\frac{x^8}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]+7\,\text{Int}\left[\frac{x^{13}}{1+2x-x^2-4x^3-2x^4-2x^7-2x^8+x^{14}},x\right]$$

Test complete!

IntegrationTest["0 Independent test suites\\Jeffrey Problems"];

Testing Rubi on 9 integration problems...

Problem #2: Valid but suboptimal antiderivative:

$$\left\{\frac{1+\text{Cos}[x]+2\,\text{Sin}[x]}{3+\text{Cos}[x]^2+2\,\text{Sin}[x]-2\,\text{Cos}[x]\,\text{Sin}[x]},\ x,\ -49,\ 49\right\}$$

$$-\text{ArcTan}\left[\frac{2\,\text{Cos}[x]-\text{Sin}[x]}{2+\text{Sin}[x]}\right]$$

$$\text{ArcTan}\left[\frac{1}{4}\left(-1+\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]\right)^2\right)\right]+\text{Cot}\left[\frac{x}{2}\right]-\frac{\text{Sin}[x]}{1-\text{Cos}[x]}$$

Problem #3: Valid but suboptimal antiderivative:

$$\left\{\frac{2+\text{Cos}[x]+5\,\text{Sin}[x]}{4\,\text{Cos}[x]-2\,\text{Sin}[x]+\text{Cos}[x]\,\text{Sin}[x]-2\,\text{Sin}[x]^2},\ x,\ -29,\ 29\right\}$$

$$-\text{Log}[1-3\,\text{Cos}[x]+\text{Sin}[x]]+\text{Log}[3+\text{Cos}[x]+\text{Sin}[x]]$$

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

Problem #4: Valid but suboptimal antiderivative:

$$\left\{\frac{3+7\,\text{Cos}[x]+2\,\text{Sin}[x]}{1+4\,\text{Cos}[x]+3\,\text{Cos}[x]^2-5\,\text{Sin}[x]-\text{Cos}[x]\,\text{Sin}[x]},\ x,\ -35,\ 35\right\}$$

$$-\text{Log}[1+\text{Cos}[x]-2\,\text{Sin}[x]]+\text{Log}[3+\text{Cos}[x]+\text{Sin}[x]]$$

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

Problem #5: Unable to integrate:

$$\left\{\frac{-1+4\,\text{Cos}[x]+5\,\text{Cos}[x]^2}{-1-4\,\text{Cos}[x]-3\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\ x,\ -2,\ 2\right\}$$

$$x-2\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{3+\text{Cos}[x]}\right]-2\,\text{ArcTan}\left[\frac{3\,\text{Sin}[x]+7\,\text{Cos}[x]\,\text{Sin}[x]}{1+2\,\text{Cos}[x]+5\,\text{Cos}[x]^2}\right]$$

$$\text{Int}\left[\frac{1}{1+4\,\text{Cos}[x]+3\,\text{Cos}[x]^2-4\,\text{Cos}[x]^3},\ x\right]+4\,\text{Int}\left[\frac{\text{Cos}[x]}{-1-4\,\text{Cos}[x]-3\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\ x\right]+5\,\text{Int}\left[\frac{\text{Cos}[x]^2}{-1-4\,\text{Cos}[x]-3\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\ x\right]$$

Problem #6: Unable to integrate:

$$\left\{\frac{-5+2\,\text{Cos}[x]+7\,\text{Cos}[x]^2}{-1+2\,\text{Cos}[x]-9\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\ x,\ -2,\ 2\right\}$$

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

$$-5\,\text{Int}\left[\frac{1}{-1+2\,\text{Cos}[x]-9\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\,x\right]+2\,\text{Int}\left[\frac{\text{Cos}[x]}{-1+2\,\text{Cos}[x]-9\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\,x\right]+7\,\text{Int}\left[\frac{\text{Cos}[x]^2}{-1+2\,\text{Cos}[x]-9\,\text{Cos}[x]^2+4\,\text{Cos}[x]^3},\,x\right]$$

Test complete!

IntegrationTest["0 Independent test suites\\Hebisch Problems"];

Testing Rubi on 7 integration problems...

Problem #2: Unable to integrate:

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

$$\text{ExpIntegralEi}\left[\frac{x}{2+x^2}\right]$$

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

Problem #3: Unable to integrate:

$$\left\{\frac{e^{\frac{x}{2+x^2}}\left(2+2\,x+3\,x^2-x^3+2\,x^4\right)}{2\,x+x^3},\,x,\,-5,\,5\right\}$$

$$e^{\frac{x}{2+x^2}}\left(2+x^2\right)+\text{ExpIntegralEi}\left[\frac{x}{2+x^2}\right]$$

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

Problem #5: Unable to integrate:

$$\left\{\frac{e^{\frac{1}{-1+x^2}}\left(1-3\,x-x^2+x^3\right)}{1-x-x^2+x^3},\,x,\,-6,\,6\right\}$$

$$e^{\frac{1}{-1+x^2}}\left(1+x\right)$$

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

Problem #7: Unable to integrate:

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

$$e^{x+\frac{1}{\text{Log}[x]}}\,x$$

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

Test complete!

IntegrationTest["0 Independent test suites\\Wester Problems"];

Testing Rubi on 8 integration problems...

Test complete!

IntegrationTest["0 Independent test suites\\Welz Problems"];

Testing Rubi on 63 integration problems...

Problem #9: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\sqrt{-1+x^2}\left(\sqrt{x}+\sqrt{-1+x^2}\right)^2},\ x,\ -18,\ 18\right\}$$

$$\frac{2-4x}{5\left(\sqrt{x}+\sqrt{-1+x^2}\right)}+\frac{1}{25}\sqrt{-110+50\sqrt{5}}\ \text{ArcTan}\left[\frac{1}{2}\sqrt{2+2\sqrt{5}}\ \sqrt{x}\right]-\frac{1}{50}\sqrt{-110+50\sqrt{5}}\ \text{ArcTan}\left[\frac{\sqrt{-2+2\sqrt{5}}\ \sqrt{-1+x^2}}{2-\left(1-\sqrt{5}\right)x}\right]-$$

$$\frac{1}{25}\sqrt{110+50\sqrt{5}}\ \text{ArcTanh}\left[\frac{1}{2}\sqrt{-2+2\sqrt{5}}\ \sqrt{x}\right]-\frac{1}{50}\sqrt{110+50\sqrt{5}}\ \text{ArcTanh}\left[\frac{\sqrt{2+2\sqrt{5}}\ \sqrt{-1+x^2}}{2-x-\sqrt{5}\,x}\right]$$

$$\frac{2(1-2x)\sqrt{x}}{5\left(1+x-x^2\right)}-\frac{2(1-2x)\sqrt{-1+x^2}}{5\left(1+x-x^2\right)}+\frac{1}{5}\sqrt{\frac{2}{5}\left(-11+5\sqrt{5}\right)}\ \text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ \sqrt{x}\right]+$$

$$\sqrt{\frac{2}{5\left(-1+\sqrt{5}\right)}}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-\frac{2}{5}\sqrt{\frac{1}{5}\left(-2+5\sqrt{5}\right)}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-$$

$$\frac{1}{5}\sqrt{\frac{2}{5}\left(11+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ \sqrt{x}\right]+\sqrt{\frac{2}{5\left(1+\sqrt{5}\right)}}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-\frac{2}{5}\sqrt{\frac{1}{5}\left(2+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]$$

Problem #10: Valid but suboptimal antiderivative:

$$\left\{\frac{\left(\sqrt{x}-\sqrt{-1+x^2}\right)^2}{\left(1+x-x^2\right)^2\sqrt{-1+x^2}},\ x,\ -25,\ 25\right\}$$

$$\frac{2-4x}{5\left(\sqrt{x}+\sqrt{-1+x^2}\right)}+\frac{1}{25}\sqrt{-110+50\sqrt{5}}\ \text{ArcTan}\left[\frac{1}{2}\sqrt{2+2\sqrt{5}}\ \sqrt{x}\right]-\frac{1}{50}\sqrt{-110+50\sqrt{5}}\ \text{ArcTan}\left[\frac{\sqrt{-2+2\sqrt{5}}\ \sqrt{-1+x^2}}{2-\left(1-\sqrt{5}\right)x}\right]-$$

$$\frac{1}{25}\sqrt{110+50\sqrt{5}}\ \text{ArcTanh}\left[\frac{1}{2}\sqrt{-2+2\sqrt{5}}\ \sqrt{x}\right]-\frac{1}{50}\sqrt{110+50\sqrt{5}}\ \text{ArcTanh}\left[\frac{\sqrt{2+2\sqrt{5}}\ \sqrt{-1+x^2}}{2-x-\sqrt{5}\,x}\right]$$

$$\frac{2\,(1-2x)\,\sqrt{x}}{5\left(1+x-x^2\right)}-\frac{(1-2x)\,\sqrt{-1+x^2}}{5\left(1+x-x^2\right)}-\frac{(3-x)\,\sqrt{-1+x^2}}{5\left(1+x-x^2\right)}+\frac{(2+x)\,\sqrt{-1+x^2}}{5\left(1+x-x^2\right)}+\frac{1}{5}\sqrt{\frac{2}{5}\left(-11+5\sqrt{5}\right)}\ \text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\ \sqrt{x}\right]-\frac{1}{5}\sqrt{\frac{1}{10}\left(-11+5\sqrt{5}\right)}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-$$

$$\frac{1}{5}\sqrt{\frac{1}{5}\left(-2+5\sqrt{5}\right)}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]+\frac{1}{5}\sqrt{\frac{1}{5}\left(2+5\sqrt{5}\right)}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-\frac{1}{5}\sqrt{\frac{2}{5}\left(11+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\ \sqrt{x}\right]-$$

$$\frac{1}{5}\sqrt{\frac{1}{5}\left(-2+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]-\frac{1}{5}\sqrt{\frac{1}{5}\left(2+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]+\frac{1}{5}\sqrt{\frac{1}{10}\left(11+5\sqrt{5}\right)}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]$$

Problem #33: Unable to integrate:

$$\left\{\frac{1}{(1+x)\left(1-x^3\right)^{1/3}},\ x,\ -1,\ 0\right\}$$

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

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

Problem #34: Unable to integrate:

$$\left\{\frac{x}{(1+x)\left(1-x^3\right)^{1/3}},\ x,\ -10,\ 10\right\}$$

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

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

Problem #35: Valid but suboptimal antiderivative:

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

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

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

Problem #36: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\left(-5+7x-3x^2+x^3\right)^{1/3}},x,-12,12\right\}$$

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

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

Problem #37: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\left(x\left(-q+x^2\right)\right)^{1/3}},x,-12,12\right\}$$

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

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

Problem #38: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\left((-1+x)\left(q-2x+x^2\right)\right)^{1/3}},\ x,\ -13,\ 13\right\}$$

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

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

Problem #39: Unable to integrate:

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

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

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

Problem #40: Unable to integrate:

$$\left\{\frac{2-(1+k)x}{\left((1-x)x(1-kx)\right)^{1/3}(1-(1+k)x)},\ x,\ -6,\ 6\right\}$$

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

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

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

Problem #41: Unable to integrate:

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

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

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

Problem #42: Unable to integrate:

$$\left\{\frac{a+b\,x+c\,x^2}{\left(1-x+x^2\right)\ \left(1-x^3\right)^{1/3}},\ x,\ -12,\ 12\right\}$$

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

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

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

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

Problem #49: Valid but suboptimal antiderivative:

$$\left\{\frac{-a-\sqrt{1+a^2}+x}{\left(-a+\sqrt{1+a^2}+x\right)\ \sqrt{(-a+x)\ \left(1+x^2\right)}},\ x,\ -6,\ 6\right\}$$

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

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

Problem #52: Valid but suboptimal antiderivative:

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

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

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

Problem #55: Unable to integrate:

$$\left\{\frac{\left(1-x^3\right)^{1/3}}{1+x},\ x,\ -1,\ 0\right\}$$

$$0$$

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

Problem #56: Unable to integrate:

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

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

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

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

Test complete!

IntegrationTest["0 Independent test suites\\Bronstein Problems"];

Testing Rubi on 14 integration problems...

Problem #6: Unable to integrate:

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

$$-\frac{1}{8}\text{Log}\left[10\,001+3124\,x^2-1408\,x^3+54\,x^4-128\,x^5+20\,x^6+x^8+\sqrt{-71-96\,x+10\,x^2+x^4}\ \left(-781+528\,x-27\,x^2+80\,x^3-15\,x^4-x^6\right)\right]$$

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

Problem #12: Unable to integrate:

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

$$\text{Log}[x]-\frac{2}{\sqrt{x+\text{Log}[x]}}$$

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

Test complete!

IntegrationTest["0 Independent test suites\\Bondarenko Problems"];

Testing Rubi on 35 integration problems...

Problem #21: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{(\text{Cos}[x]+\text{Cos}[3\,x])^5},\ x,\ -57,\ 57\right\}$$

$$-\frac{523}{256}\text{ArcTanh}[\text{Sin}[x]]+\frac{1483\,\text{ArcTanh}\left[\sqrt{2}\ \text{Sin}[x]\right]}{512\sqrt{2}}+\frac{\text{Sin}[x]}{32\left(1-2\,\text{Sin}[x]^2\right)^4}-\frac{17\,\text{Sin}[x]}{192\left(1-2\,\text{Sin}[x]^2\right)^3}+\frac{203\,\text{Sin}[x]}{768\left(1-2\,\text{Sin}[x]^2\right)^2}-\frac{437\,\text{Sin}[x]}{512\left(1-2\,\text{Sin}[x]^2\right)}-\frac{43}{256}\text{Sec}[x]\,\text{Tan}[x]-\frac{1}{128}\text{Sec}[x]^3\,\text{Tan}[x]$$

$$-\frac{523}{256}\text{ArcTanh}[\text{Sin}[x]]-\frac{1483\,\text{Log}\left[2+\sqrt{2}+\text{Cos}[x]+\sqrt{2}\,\text{Cos}[x]-\text{Sin}[x]-\sqrt{2}\,\text{Sin}[x]\right]}{2048\sqrt{2}}-\frac{1483\,\text{Log}\left[2-\sqrt{2}+\text{Cos}[x]-\sqrt{2}\,\text{Cos}[x]+\text{Sin}[x]-\sqrt{2}\,\text{Sin}[x]\right]}{2048\sqrt{2}}+$$

$$\frac{1483\,\text{Log}\left[2-\sqrt{2}+\text{Cos}[x]-\sqrt{2}\,\text{Cos}[x]-\text{Sin}[x]+\sqrt{2}\,\text{Sin}[x]\right]}{2048\sqrt{2}}+\frac{1483\,\text{Log}\left[2+\sqrt{2}+\text{Cos}[x]+\sqrt{2}\,\text{Cos}[x]+\text{Sin}[x]+\sqrt{2}\,\text{Sin}[x]\right]}{2048\sqrt{2}}-\frac{9\,372\,189\,581}{620\,780\,160\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)^4}-$$

$$\frac{115\,444\,608\,337}{931\,170\,240\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)^3}-\frac{125\,776\,127\,011}{196\,035\,840\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)^2}-\frac{273\,389\,009\,815}{106\,419\,456\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)}+\frac{9\,372\,189\,581}{620\,780\,160\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)^4}+\frac{115\,444\,608\,337}{931\,170\,240\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)^3}+\frac{125\,776\,127\,011}{196\,035\,840\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)^2}+$$

$$\frac{273\,389\,009\,815}{106\,419\,456\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)}-\frac{2\,174\,977\,520\,729+900\,895\,026\,797\,\text{Tan}\left[\frac{x}{2}\right]}{465\,585\,120\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^4}-\frac{900\,895\,026\,797\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)}{798\,145\,920\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^3}+\frac{38\,884\,413\,000\,239+18\,217\,810\,835\,525\,\text{Tan}\left[\frac{x}{2}\right]}{5\,587\,021\,440\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^3}+$$

$$\frac{94\,536\,076\,571\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)}{70\,946\,304\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}-\frac{65\,580\,529\,660\,561+30\,915\,686\,684\,873\,\text{Tan}\left[\frac{x}{2}\right]}{7\,449\,361\,920\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}-\frac{954\,063\,574\,769\left(1+\text{Tan}\left[\frac{x}{2}\right]\right)}{451\,476\,480\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)}+\frac{137\,658\,750\,217\,805+69\,771\,275\,635\,067\,\text{Tan}\left[\frac{x}{2}\right]}{14\,898\,723\,840\left(1-2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)}+$$

$$\frac{2\,174\,977\,520\,729-900\,895\,026\,797\,\text{Tan}\left[\frac{x}{2}\right]}{465\,585\,120\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^4}-\frac{38\,884\,413\,000\,239-18\,217\,810\,835\,525\,\text{Tan}\left[\frac{x}{2}\right]}{5\,587\,021\,440\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^3}+\frac{900\,895\,026\,797\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)}{798\,145\,920\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^3}+\frac{65\,580\,529\,660\,561-30\,915\,686\,684\,873\,\text{Tan}\left[\frac{x}{2}\right]}{7\,449\,361\,920\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}-$$

$$\frac{94\,536\,076\,571\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)}{70\,946\,304\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}-\frac{137\,658\,750\,217\,805-69\,771\,275\,635\,067\,\text{Tan}\left[\frac{x}{2}\right]}{14\,898\,723\,840\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)}+\frac{954\,063\,574\,769\left(1-\text{Tan}\left[\frac{x}{2}\right]\right)}{451\,476\,480\left(1+2\,\text{Tan}\left[\frac{x}{2}\right]-\text{Tan}\left[\frac{x}{2}\right]^2\right)}+\frac{1\,486\,633\,486\,121\,\text{Tan}\left[\frac{x}{2}\right]}{33\,256\,080\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+$$

$$\frac{2\,833\,881\,904\,961\,\text{Tan}\left[\frac{x}{2}\right]^3}{232\,792\,560\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{801\,211\,946\,693\,\text{Tan}\left[\frac{x}{2}\right]^5}{232\,792\,560\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{1\,842\,220\,447\,\text{Tan}\left[\frac{x}{2}\right]^7}{1\,750\,320\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+$$

$$\frac{11\,825\,071\,\text{Tan}\left[\frac{x}{2}\right]^9}{51\,480\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{17\,348\,075\,\text{Tan}\left[\frac{x}{2}\right]^{11}}{72\,072\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}-\frac{424\,843\,\text{Tan}\left[\frac{x}{2}\right]^{13}}{3960\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{34\,529\,\text{Tan}\left[\frac{x}{2}\right]^{15}}{360\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}-$$

$$\frac{48\,883\,\text{Tan}\left[\frac{x}{2}\right]^{17}}{1680\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{1813\,\text{Tan}\left[\frac{x}{2}\right]^{19}}{240\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}-\frac{35\,\text{Tan}\left[\frac{x}{2}\right]^{21}}{48\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}+\frac{\text{Tan}\left[\frac{x}{2}\right]^{23}}{16\left(1-7\,\text{Tan}\left[\frac{x}{2}\right]^2+7\,\text{Tan}\left[\frac{x}{2}\right]^4-\text{Tan}\left[\frac{x}{2}\right]^6\right)^4}$$

Problem #24: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Tanh}[x]}{\sqrt{e^x+e^{2x}}},\,x,\,-13,\,13\right\}$$

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

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

Problem #26: Valid but suboptimal antiderivative:

$$\left\{\text{Log}\left[x^2+\sqrt{1-x^2}\right], x, -34, 34\right\}$$

$$-2x - \text{ArcSin}[x] + \sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,x\right] + \sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] +$$

$$\sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,x\right] - \sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] + x\,\text{Log}\left[x^2+\sqrt{1-x^2}\right]$$

$$-2x - \text{ArcSin}[x] - \sqrt{\frac{1}{10}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,x\right] + 2\sqrt{\frac{1}{5}\left(2+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,x\right] -$$

$$\sqrt{\frac{1}{10}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] + 2\sqrt{\frac{1}{5}\left(2+\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] + 2\sqrt{\frac{1}{5}\left(-2+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,x\right] +$$

$$\sqrt{\frac{1}{10}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,x\right] - 2\sqrt{\frac{1}{5}\left(-2+\sqrt{5}\right)}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] - \sqrt{\frac{1}{10}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,x}{\sqrt{1-x^2}}\right] + x\,\text{Log}\left[x^2+\sqrt{1-x^2}\right]$$

Test complete!

1 Algebraic functions

- **1 Linear products**

IntegrationTest["1 Algebraic functions\\1 Linear products\\1.2 (a+b x)^m (c+d x)^n"];

Testing Rubi on 1568 integration problems...

Problem ⌗336: Valid but suboptimal antiderivative:

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

$$\frac{x^m}{\sqrt{a+b\,x}}$$

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

Test complete!

IntegrationTest["1 Algebraic functions\\1 Linear products\\1.3 (a+b x)^m (c+d x)^n (e+f x)^p"];

Testing Rubi on 3129 integration problems...

Problem ⌗856: Valid but suboptimal antiderivative:

$$\left\{\frac{\sqrt{-1+\frac{1}{x}}\ \sqrt{\frac{1}{x}}\ \sqrt{x}}{\sqrt{1+x}},\ x,\ -6,\ 6\right\}$$

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

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

Problem ⌗986: Valid but suboptimal antiderivative:

$$\left\{\frac{(1-a\,x)^{1-n}\,(1+a\,x)^{1+n}}{x^2},\ x,\ -1,\ 1\right\}$$

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

$$\frac{2^{1-n}\,a\,(1+a\,x)^{2+n}\,\text{AppellF1}\left[2+n,\ -1+n,\ 2,\ 3+n,\ \frac{1}{2}\,(1+a\,x),\ 1+a\,x\right]}{2+n}$$

Test complete!

IntegrationTest["1 Algebraic functions\\1 Linear products\\1.4 (a+b x)^m (c+d x)^n (e+f x)^p (g+h x)^q"];

Testing Rubi on 81 integration problems...

Test complete!

- **2 Quadratic products**

IntegrationTest["1 Algebraic functions\\2 Quadratic products\\2.2 (d+e x)^m (a+b x+c x^2)^p"];

Testing Rubi on 2998 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\2 Quadratic products\\2.3 (d+e x)^m (f+g x)^n (a+b x+c x^2)^p"];

Testing Rubi on 3199 integration problems...

Problem #3147: Valid but suboptimal antiderivative:

$$\left\{\frac{\sqrt{-1+x}\ \sqrt{1+x}}{1+x-x^2},\ x,\ -9,\ 9\right\}$$

$$-\text{ArcCosh}[x]+\sqrt{\frac{2}{5}\left(-1+\sqrt{5}\right)}\ \text{ArcTan}\left[\frac{\sqrt{1+x}}{\sqrt{-2+\sqrt{5}}\ \sqrt{-1+x}}\right]+\sqrt{\frac{2}{5}\left(1+\sqrt{5}\right)}\ \text{ArcTanh}\left[\frac{\sqrt{1+x}}{\sqrt{2+\sqrt{5}}\ \sqrt{-1+x}}\right]$$

$$\frac{\sqrt{\frac{1}{10}\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x}\ \sqrt{1+x}\ \text{ArcTan}\left[\frac{2-\left(1-\sqrt{5}\right)x}{\sqrt{2\left(-1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]}{\sqrt{-1+x^2}}-\frac{\sqrt{-1+x}\ \sqrt{1+x}\ \text{ArcTanh}\left[\frac{x}{\sqrt{-1+x^2}}\right]}{\sqrt{-1+x^2}}-\frac{\sqrt{\frac{1}{10}\left(1+\sqrt{5}\right)}\ \sqrt{-1+x}\ \sqrt{1+x}\ \text{ArcTanh}\left[\frac{2-\left(1+\sqrt{5}\right)x}{\sqrt{2\left(1+\sqrt{5}\right)}\ \sqrt{-1+x^2}}\right]}{\sqrt{-1+x^2}}$$

Test complete!

IntegrationTest["1 Algebraic functions\\2 Quadratic products\\2.4 (a+b x+c x^2)^p (d+e x+f x^2)^q"];

Testing Rubi on 168 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\2 Quadratic products\\2.5 (g+h x)^m (a+b x+c x^2)^p (d+e x+f x^2)^q"];

Testing Rubi on 227 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\2 Quadratic products\\2.6 (a+b x+c x^2)^p (d+e x+f x^2)^q (A+B x+C x^2)"];

Testing Rubi on 33 integration problems...

Test complete!

▪ 3 Binomial products

```
IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.2 (c x)^m (a+b x^n)^p"];
```

Testing Rubi on 3912 integration problems...

Problem #1217: Valid but suboptimal antiderivative:

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

$$x^{2+m}\sqrt{a+b\,x^2}$$

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

Problem #1219: Valid but not optimal or suboptimal antiderivative:

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

$$\frac{x^m}{\sqrt{a+b\,x^2}}$$

$$-\frac{b\,x^{2+m}}{a\sqrt{a+b\,x^2}}+\frac{x^m\sqrt{a+b\,x^2}}{a}$$

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

Problem #3686: Valid but not optimal or suboptimal antiderivative:

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

$$\frac{x^m}{\sqrt{a+b\,x^n}}$$

$$-\frac{b\,x^{m+n}}{a\sqrt{a+b\,x^n}}+\frac{x^m\sqrt{a+b\,x^n}}{a}$$

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

Problem #3697: Valid but not optimal or suboptimal antiderivative:

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

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

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

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

Problem #3699: Valid but not optimal or suboptimal antiderivative:

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

$$\frac{x^m}{\sqrt{a+b\,x^n}}$$

$$-\frac{b\,x^{m+n}}{a\,\sqrt{a+b\,x^n}}+\frac{x^m\,\sqrt{a+b\,x^n}}{a}$$

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

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.3 (a+b x^n)^p (c+d x^n)^q"];

```
Testing Rubi on 569 integration problems...

Problem #287: Valid but suboptimal antiderivative:
```

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

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

$$x\ \text{AppellF1}\left[\frac{1}{2}, -m, \frac{1}{2}, \frac{3}{2}, 2x^2, x^2\right]$$

```
Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.4 (e x)^m (a+b x^n)^p (c+d x^n)^q"];

Testing Rubi on 1795 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.5 (a+b x^n)^p (c+d x^n)^q (e+f x^n)^r"];

Testing Rubi on 115 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.6 (g x)^m (a+b x^n)^p (c+d x^n)^q (e+f x^n)^r"];

Testing Rubi on 97 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.7 (c x)^m Pq(x) (a+b x^n)^p"];

Testing Rubi on 561 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.9 (c x)^m (a x^j+b x^n)^p"];

Testing Rubi on 454 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\3 Binomial products\\3.10 (e x)^m (a x^j+b x^k)^p (c+d x^n)^q"];

Testing Rubi on 295 integration problems...

Test complete!
```

- **4 Trinomial products**

```
IntegrationTest["1 Algebraic functions\\4 Trinomial products\\4.2 (d x)^m (a+b x^n+c x^(2 n))^p"];
```

```
Testing Rubi on 1762 integration problems...

Problem #1574: Valid but suboptimal antiderivative:
```

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

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

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

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

```
Test complete!

IntegrationTest["1 Algebraic functions\\4 Trinomial products\\4.3 (d+e x^n)^q (a+b x^n+c x^(2 n))^p"];

Testing Rubi on 341 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\4 Trinomial products\\4.4 (f x)^m (d+e x^n)^q (a+b x^n+c x^(2 n))^p"];
```

```
Testing Rubi on 436 integration problems...

Problem #254: Valid but suboptimal antiderivative:
```

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

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

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

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

```
Test complete!

IntegrationTest["1 Algebraic functions\\4 Trinomial products\\4.5 (d x)^m Pq(x) (a+b x^n+c x^(2 n))^p"];

Testing Rubi on 177 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\4 Trinomial products\\4.7 (d x)^m (a x^q+b x^n+c x^(2 n-q))^p"];

Testing Rubi on 122 integration problems...

Test complete!
```

5 Miscellaneous

```
IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.1 Rational functions"];
```

Testing Rubi on 269 integration problems...

Problem #154: Valid but suboptimal antiderivative:

$$\left\{\frac{-20\,x+4\,x^2}{9-10\,x^2+x^4},\,x,\,-10,\,10\right\}$$

$$\text{Log}[1-x]-\frac{1}{2}\text{Log}[3-x]+\frac{3}{2}\text{Log}[1+x]-2\,\text{Log}[3+x]$$
$$-\frac{3}{2}\text{ArcTanh}\left[\frac{x}{3}\right]+\frac{\text{ArcTanh}[x]}{2}+\frac{5}{4}\text{Log}\left[1-x^2\right]-\frac{5}{4}\text{Log}\left[9-x^2\right]$$

Problem #203: Unable to integrate:

$$\left\{\frac{3\left(-47+228\,x+120\,x^2+19\,x^3\right)}{\left(3+x+x^4\right)^4}+\frac{42-320\,x-75\,x^2-8\,x^3}{\left(3+x+x^4\right)^3}+\frac{30\,x}{\left(3+x+x^4\right)^2},\,x,\,-7,\,7\right\}$$

$$\frac{2-3\,x+5\,x^2+x^4-5\,x^6}{\left(3+x+x^4\right)^3}$$
$$-\frac{19}{4\left(3+x+x^4\right)^3}+\frac{1}{\left(3+x+x^4\right)^2}-\frac{621}{4}\text{Int}\left[\frac{1}{\left(3+x+x^4\right)^4},\,x\right]+684\,\text{Int}\left[\frac{x}{\left(3+x+x^4\right)^4},\,x\right]+$$
$$360\,\text{Int}\left[\frac{x^2}{\left(3+x+x^4\right)^4},\,x\right]+44\,\text{Int}\left[\frac{1}{\left(3+x+x^4\right)^3},\,x\right]-320\,\text{Int}\left[\frac{x}{\left(3+x+x^4\right)^3},\,x\right]-75\,\text{Int}\left[\frac{x^2}{\left(3+x+x^4\right)^3},\,x\right]+30\,\text{Int}\left[\frac{x}{\left(3+x+x^4\right)^2},\,x\right]$$

Problem #204: Unable to integrate:

$$\left\{\frac{-3+10\,x+4\,x^3-30\,x^5}{\left(3+x+x^4\right)^3}-\frac{3\left(1+4\,x^3\right)\left(2-3\,x+5\,x^2+x^4-5\,x^6\right)}{\left(3+x+x^4\right)^4},\,x,\,-13,\,13\right\}$$

$$\frac{2-3\,x+5\,x^2+x^4-5\,x^6}{\left(3+x+x^4\right)^3}$$
$$\frac{7}{2\left(3+x+x^4\right)^3}-\frac{63\,x}{22\left(3+x+x^4\right)^3}-\frac{12\,x^2}{\left(3+x+x^4\right)^3}-\frac{5\,x^3}{\left(3+x+x^4\right)^3}+\frac{3\,x^4}{2\left(3+x+x^4\right)^3}-\frac{10\,x^6}{\left(3+x+x^4\right)^3}-\frac{1}{2\left(3+x+x^4\right)^2}+\frac{5\,x^2}{\left(3+x+x^4\right)^2}+$$
$$\frac{144}{11}\text{Int}\left[\frac{1}{\left(3+x+x^4\right)^4},\,x\right]+\frac{828}{11}\text{Int}\left[\frac{x}{\left(3+x+x^4\right)^4},\,x\right]+18\,\text{Int}\left[\frac{x^2}{\left(3+x+x^4\right)^4},\,x\right]-4\,\text{Int}\left[\frac{1}{\left(3+x+x^4\right)^3},\,x\right]-20\,\text{Int}\left[\frac{x}{\left(3+x+x^4\right)^3},\,x\right]$$

Test complete!

IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.2 Algebraic functions"];

Testing Rubi on 717 integration problems...

Problem #380: Valid but suboptimal antiderivative:

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

$$\frac{2\,x^{1-n}\,\sqrt{a\,x^{2\,n}}\ \sqrt{1+x^n}}{2+n}$$

$$\frac{x\,\sqrt{a\,x^{2\,n}}\ \text{Hypergeometric2F1}\left[\frac{1}{2},\ 1+\frac{1}{n},\ 2+\frac{1}{n},\ -x^n\right]}{1+n}+\frac{2\,x^{1-n}\,\sqrt{a\,x^{2\,n}}\ \text{Hypergeometric2F1}\left[\frac{1}{2},\ \frac{1}{n},\ 1+\frac{1}{n},\ -x^n\right]}{2+n}$$

Problem #540: Unable to integrate:

$$\left\{\frac{\left(d^3+e^3\,x^3\right)^p}{d+e\,x},\ x,\ -1,\ 0\right\}$$

$$\frac{1}{e\,p}\left(d^3+e^3\,x^3\right)^p\left(1+\frac{2\,(d+e\,x)}{\left(-3+i\,\sqrt{3}\right)d}\right)^{-p}\left(1-\frac{2\,(d+e\,x)}{\left(3+i\,\sqrt{3}\right)d}\right)^{-p}\text{AppellF1}\left[p,\ -p,\ -p,\ 1+p,\ -\frac{2\,(d+e\,x)}{\left(-3+i\,\sqrt{3}\right)d},\ \frac{2\,(d+e\,x)}{\left(3+i\,\sqrt{3}\right)d}\right]$$

$$\text{Int}\left[\frac{\left(d^3+e^3\,x^3\right)^p}{d+e\,x},\ x\right]$$

Problem #636: Valid but suboptimal antiderivative:

$$\left\{\left(1-x^6\right)^{2/3}+\frac{\left(1-x^6\right)^{2/3}}{x^6},\ x,\ -3,\ 3\right\}$$

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

$$-\frac{\text{Hypergeometric2F1}\left[-\frac{5}{6},\ -\frac{2}{3},\ \frac{1}{6},\ x^6\right]}{5\,x^5}+x\,\text{Hypergeometric2F1}\left[-\frac{2}{3},\ \frac{1}{6},\ \frac{7}{6},\ x^6\right]$$

Problem #694: Unable to integrate:

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

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

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

Problem #695: Unable to integrate:

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

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

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

Problem #696: Valid but suboptimal antiderivative:

$$\left\{-\frac{x+2\sqrt{1+x^2}}{x+x^3+\sqrt{1+x^2}},\ x,\ -25,\ 25\right\}$$

$$-\sqrt{2\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{-2+\sqrt{5}}\,\left(x+\sqrt{1+x^2}\right)\right]+\sqrt{2\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{2+\sqrt{5}}\,\left(x+\sqrt{1+x^2}\right)\right]$$

$$-2\sqrt{\frac{2}{5\left(1+\sqrt{5}\right)}}\,\text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,x\right]-\sqrt{\frac{1}{10}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,x\right]-\sqrt{\frac{2}{5\left(-1+\sqrt{5}\right)}}\,\text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,\sqrt{1+x^2}\right]-\sqrt{\frac{2}{5}\left(-1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,\sqrt{1+x^2}\right]-$$

$$2\sqrt{\frac{2}{5\left(-1+\sqrt{5}\right)}}\,\text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,x\right]+\sqrt{\frac{1}{10}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{\frac{2}{-1+\sqrt{5}}}\,x\right]-\sqrt{\frac{2}{5\left(1+\sqrt{5}\right)}}\,\text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,\sqrt{1+x^2}\right]+\sqrt{\frac{2}{5}\left(1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{\frac{2}{1+\sqrt{5}}}\,\sqrt{1+x^2}\right]$$

Problem #716: Unable to integrate:

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

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

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

Problem #717: Valid but suboptimal antiderivative:

$$\left\{\frac{x^2}{\sqrt{-1+x^4}\,\left(1+x^4\right)},\ x,\ -17,\ 17\right\}$$

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

$$\frac{i\sqrt{1-x^2}\ \sqrt{1+x^2}\ \text{EllipticPi}[-i, \text{ArcSin}[x], -1]}{2\sqrt{-1+x^4}} - \frac{i\sqrt{1-x^2}\ \sqrt{1+x^2}\ \text{EllipticPi}[i, \text{ArcSin}[x], -1]}{2\sqrt{-1+x^4}}$$

Test complete!

IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.3 Expansion problems"];

Testing Rubi on 110 integration problems...

Problem #94: Boo; correct but **31** steps required!

$$\left\{\frac{-1+\sqrt{1-x^2}}{\sqrt{1-x^2}\ \left(2+x-2\sqrt{1-x^2}\right)^2}, x, 0, \frac{3}{5\ (4+5\,x)} + \frac{\sqrt{1-x^2}}{4+5\,x}\right\}$$

Test complete!

IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.4 Substitution problems"];

Testing Rubi on 364 integration problems...

Problem ⌗54: Valid but suboptimal antiderivative:

$$\left\{b\,x^{1+p}\left(b\,x+c\,x^3\right)^p+2\,c\,x^{3+p}\left(b\,x+c\,x^3\right)^p,\ x,\ -7,\ 7\right\}$$

$$\frac{x^{1+p}\left(b\,x+c\,x^3\right)^{1+p}}{2\,(1+p)}$$

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

Problem ⌗59: Valid but suboptimal antiderivative:

$$\left\{(1+2\,x)\left(x+x^2\right)^3\left(-18+7\left(x+x^2\right)^3\right)^2,\ x,\ -3,\ 3\right\}$$

$$81\,x^4\,(1+x)^4-36\,x^7\,(1+x)^7+\frac{49}{10}\,x^{10}\,(1+x)^{10}$$

$$81\,x^4+324\,x^5+486\,x^6+288\,x^7-171\,x^8-756\,x^9-\frac{12\,551\,x^{10}}{10}-1211\,x^{11}-\frac{1071\,x^{12}}{2}+336\,x^{13}+993\,x^{14}+\frac{6174\,x^{15}}{5}+1029\,x^{16}+588\,x^{17}+\frac{441\,x^{18}}{2}+49\,x^{19}+\frac{49\,x^{20}}{10}$$

Problem ⌗60: Valid but suboptimal antiderivative:

$$\left\{x^3\,(1+x)^3\,(1+2\,x)\left(-18+7\,x^3\,(1+x)^3\right)^2,\ x,\ -2,\ 2\right\}$$

$$81\,x^4\,(1+x)^4-36\,x^7\,(1+x)^7+\frac{49}{10}\,x^{10}\,(1+x)^{10}$$

$$81\,x^4+324\,x^5+486\,x^6+288\,x^7-171\,x^8-756\,x^9-\frac{12\,551\,x^{10}}{10}-1211\,x^{11}-\frac{1071\,x^{12}}{2}+336\,x^{13}+993\,x^{14}+\frac{6174\,x^{15}}{5}+1029\,x^{16}+588\,x^{17}+\frac{441\,x^{18}}{2}+49\,x^{19}+\frac{49\,x^{20}}{10}$$

Test complete!

IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.5 Piecewise constant extraction"];

Testing Rubi on 66 integration problems...

Test complete!

IntegrationTest["1 Algebraic functions\\5 Miscellaneous\\5.6 Derivative integration problems"];

```
Testing Rubi on 97 integration problems...

Problem #24: Unable to integrate:

{g[x] f'[x] + f[x] g'[x], x, -1, 1}

f[x] g[x]

Int[g[x] f'[x], x] + Int[f[x] g'[x], x]


Problem #43: Unable to integrate:

{Cos[x] g[e^x] f'[Sin[x]] + e^x f[Sin[x]] g'[e^x], x, -1, 1}

f[Sin[x]] g[e^x]

Int[Cos[x] g[e^x] f'[Sin[x]], x] + Int[e^x f[Sin[x]] g'[e^x], x]


Test complete!
```

2 Exponentials

```
IntegrationTest["2 Exponentials\\2.1 u (F^(c (a+b x)))^n"];

Testing Rubi on 98 integration problems...

Test complete!

IntegrationTest["2 Exponentials\\2.2 (c+d x)^m (F^(g (e+f x)))^n (a+b (F^(g (e+f x)))^n)^p"];

Testing Rubi on 88 integration problems...

Test complete!

IntegrationTest["2 Exponentials\\2.3 Exponential functions"];

Testing Rubi on 726 integration problems...

Problem #63: Unable to integrate:
```

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

$$\frac{f^{x}}{8 a b \left(b+a f^{2 x}\right) \text{Log}[f]^{2}}-\frac{f^{x} x}{4 a \left(b+a f^{2 x}\right)^{2} \text{Log}[f]}+\frac{f^{x} x}{8 a b \left(b+a f^{2 x}\right) \text{Log}[f]}+\frac{x \text{ArcTan}\left[\frac{\sqrt{a} f^{x}}{\sqrt{b}}\right]}{8 a^{3/2} b^{3/2} \text{Log}[f]}-\frac{i \text{PolyLog}\left[2, -\frac{i \sqrt{a} f^{x}}{\sqrt{b}}\right]}{16 a^{3/2} b^{3/2} \text{Log}[f]^{2}}+\frac{i \text{PolyLog}\left[2, \frac{i \sqrt{a} f^{x}}{\sqrt{b}}\right]}{16 a^{3/2} b^{3/2} \text{Log}[f]^{2}}$$

$$\text{Int}\left[\frac{f^{3 x} x}{\left(b+a f^{2 x}\right)^{3}}, x\right]$$

Problem #64: Unable to integrate:

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

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

$$\frac{x^2\,\text{ArcTan}\left[\frac{\sqrt{a}\ f^{x}}{\sqrt{b}}\right]}{8\,a^{3/2}\,b^{3/2}\,\text{Log}[f]}-\frac{i\,x\,\text{PolyLog}\left[2,\ -\frac{i\,\sqrt{a}\ f^{x}}{\sqrt{b}}\right]}{8\,a^{3/2}\,b^{3/2}\,\text{Log}[f]^2}+\frac{i\,x\,\text{PolyLog}\left[2,\ \frac{i\,\sqrt{a}\ f^{x}}{\sqrt{b}}\right]}{8\,a^{3/2}\,b^{3/2}\,\text{Log}[f]^2}+\frac{i\,\text{PolyLog}\left[3,\ -\frac{i\,\sqrt{a}\ f^{x}}{\sqrt{b}}\right]}{8\,a^{3/2}\,b^{3/2}\,\text{Log}[f]^3}-\frac{i\,\text{PolyLog}\left[3,\ \frac{i\,\sqrt{a}\ f^{x}}{\sqrt{b}}\right]}{8\,a^{3/2}\,b^{3/2}\,\text{Log}[f]^3}$$

$$\text{Int}\left[\frac{f^{3\,x}\,x^2}{\left(b+a\,f^{2\,x}\right)^3},\ x\right]$$

Problem #645: Unable to integrate:

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

$$e^{x^x}\,(-1+x^x)$$

$$\text{Int}\left[e^{x^x}\,x^{2\,x},\ x\right]+\text{Log}[x]\,\text{Int}\left[e^{x^x}\,x^{2\,x},\ x\right]-\text{Int}\left[\frac{\text{Int}\left[e^{x^x}\,x^{2\,x},\ x\right]}{x},\ x\right]$$

Problem #647: Unable to integrate:

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

$$-x^{-1/x}$$

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

Test complete!

3 Logarithms

IntegrationTest["3 Logarithms\\3.1 u (a+b log(c (d (e+f x)^p)^q))^n"];

Testing Rubi on 280 integration problems...

Test complete!

IntegrationTest["3 Logarithms\\3.2 Logarithm functions"];

Testing Rubi on 806 integration problems...

Problem #199: Unable to integrate:

$$\left\{\frac{(d+e\,x)^m \operatorname{Log}[c\,x]}{x},\ x,\ -1,\ 0\right\}$$

$$-\frac{\left(1+\frac{d}{e\,x}\right)^{-m}(d+e\,x)^m\,\text{HypergeometricPFQ}\left[\{-m,-m,-m\},\{1-m,1-m\},-\frac{d}{e\,x}\right]}{m^2}+\frac{\left(1+\frac{d}{e\,x}\right)^{-m}(d+e\,x)^m\,\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{d}{e\,x}\right]\operatorname{Log}[c\,x]}{m}$$

$$\text{Int}\left[\frac{(d+e\,x)^m \operatorname{Log}[c\,x]}{x},\ x\right]$$

Test complete!

4 Trig functions

- **1a Sine**

IntegrationTest["4 Trig functions\\1a Sine\\1.0 (a sin)^m (b trg)^n"];

Testing Rubi on 538 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.1.1 (a+b sin)^n"];

Testing Rubi on 64 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.1.2 (g cos)^p (a+b sin)^m"];

Testing Rubi on 653 integration problems...

Problem #648: Valid but suboptimal antiderivative:

$$\left\{(e\,\text{Cos}[c+d\,x])^{-3-m}\,(a+b\,\text{Sin}[c+d\,x])^{m},\,x,\,-5,\,5\right\}$$

$$\frac{1}{(a-b)\,d\,e^3\,(2+m)}(e\,\text{Cos}[c+d\,x])^{-m}\,\text{Sec}[c+d\,x]^4\,(-1+\text{Sin}[c+d\,x])\,(1+\text{Sin}[c+d\,x])\,(a+b\,\text{Sin}[c+d\,x])^{1+m}+$$
$$\left((-2\,b+a\,(2+m))\,(e\,\text{Cos}[c+d\,x])^{-m}\,\text{Sec}[c+d\,x]^4\,(-1+\text{Sin}[c+d\,x])\,(1+\text{Sin}[c+d\,x])^2\,(a+b\,\text{Sin}[c+d\,x])^{1+m}\right)\Big/\left((a-b)^2\,d\,e^3\,m\,(2+m)\right)-$$
$$\left(\left(-b^2+a^2\,(1+m)\right)(e\,\text{Cos}[c+d\,x])^{-m}\,\text{Hypergeometric2F1}\left[\frac{m}{2},\,1+m,\,2+m,\,-\frac{2\,(a+b\,\text{Sin}[c+d\,x])}{(a-b)\,(-1+\text{Sin}[c+d\,x])}\right]\right.$$
$$\left.\text{Sec}[c+d\,x]^4\,(1+\text{Sin}[c+d\,x])^3\left(\frac{(a+b)\,(1+\text{Sin}[c+d\,x])}{(a-b)\,(-1+\text{Sin}[c+d\,x])}\right)^{\frac{1}{2}(-2+m)}(a+b\,\text{Sin}[c+d\,x])^{1+m}\right)\Big/\left((a-b)^3\,d\,e^3\,m\,(1+m)\right)$$
$$-\frac{(e\,\text{Cos}[c+d\,x])^{-2-m}\,(a+b\,\text{Sin}[c+d\,x])^{1+m}}{(a-b)\,d\,e\,(2+m)}-$$
$$\left(b\,(e\,\text{Cos}[c+d\,x])^{-2-m}\,\text{Hypergeometric2F1}\left[1+m,\,\frac{2+m}{2},\,2+m,\,\frac{2\,(a+b\,\text{Sin}[c+d\,x])}{(a+b)\,(1+\text{Sin}[c+d\,x])}\right](1-\text{Sin}[c+d\,x])\left(-\frac{(a-b)\,(1-\text{Sin}[c+d\,x])}{(a+b)\,(1+\text{Sin}[c+d\,x])}\right)^{m/2}(a+b\,\text{Sin}[c+d\,x])^{1+m}\right)\Big/$$
$$\left(\left(a^2-b^2\right)d\,e\,(1+m)\,(2+m)\right)+\frac{a\,(e\,\text{Cos}[c+d\,x])^{-2-m}\,(1+\text{Sin}[c+d\,x])\,(a+b\,\text{Sin}[c+d\,x])^{1+m}}{\left(a^2-b^2\right)d\,e\,(2+m)}+$$
$$\left(2^{-m/2}\,a\,(a+b+a\,m)\,(e\,\text{Cos}[c+d\,x])^{-2-m}\,\text{Hypergeometric2F1}\left[-\frac{m}{2},\,\frac{2+m}{2},\,\frac{2-m}{2},\,\frac{(a-b)\,(1-\text{Sin}[c+d\,x])}{2\,(a+b\,\text{Sin}[c+d\,x])}\right](1-\text{Sin}[c+d\,x])\left(\frac{(a+b)\,(1+\text{Sin}[c+d\,x])}{a+b\,\text{Sin}[c+d\,x]}\right)^{\frac{2+m}{2}}(a+b\,\text{Sin}[c+d\,x])^{1+m}\right)\Big/$$
$$\left((a-b)\,(a+b)^2\,d\,e\,m\,(2+m)\right)$$

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.1.3 (g tan)^p (a+b sin)^m"];

Testing Rubi on 208 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.2.1 (a+b sin)^m (c+d sin)^n"];

Testing Rubi on 837 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.2.2 (g cos)^p (a+b sin)^m (c+d sin)^n"];

Testing Rubi on 1562 integration problems...

Problem #1277: Valid but suboptimal antiderivative:

$$\left\{\frac{(a+b\,\text{Sin}[e+f\,x])^2}{(g\,\text{Cos}[e+f\,x])^{5/2}\sqrt{d\,\text{Sin}[e+f\,x]}},\ x,\ -11,\ 11\right\}$$

$$\frac{2\left(a^2+b^2\right)\sqrt{d\,\text{Sin}[e+f\,x]}}{3\,d\,f\,g\,(g\,\text{Cos}[e+f\,x])^{3/2}}+\frac{4\,a\,b\,(d\,\text{Sin}[e+f\,x])^{3/2}}{3\,d^2\,f\,g\,(g\,\text{Cos}[e+f\,x])^{3/2}}+\frac{\left(2\,a^2-b^2\right)\text{EllipticF}\left[\frac{1}{4}\,(4\,e-\pi)+f\,x,\,2\right]\sqrt{\text{Sin}[2\,e+2\,f\,x]}}{3\,f\,g^2\sqrt{g\,\text{Cos}[e+f\,x]}\ \sqrt{d\,\text{Sin}[e+f\,x]}}$$

$$\frac{2\,a^2\sqrt{d\,\text{Sin}[e+f\,x]}}{3\,d\,f\,g\,(g\,\text{Cos}[e+f\,x])^{3/2}}+\frac{2\,b^2\sqrt{d\,\text{Sin}[e+f\,x]}}{3\,d\,f\,g\,(g\,\text{Cos}[e+f\,x])^{3/2}}+\frac{4\,a\,b\,(d\,\text{Sin}[e+f\,x])^{3/2}}{3\,d^2\,f\,g\,(g\,\text{Cos}[e+f\,x])^{3/2}}+\frac{2\,a^2\,\text{EllipticF}\left[e-\frac{\pi}{4}+f\,x,\,2\right]\sqrt{\text{Sin}[2\,e+2\,f\,x]}}{3\,f\,g^2\sqrt{g\,\text{Cos}[e+f\,x]}\ \sqrt{d\,\text{Sin}[e+f\,x]}}-\frac{b^2\,\text{EllipticF}\left[e-\frac{\pi}{4}+f\,x,\,2\right]\sqrt{\text{Sin}[2\,e+2\,f\,x]}}{3\,f\,g^2\sqrt{g\,\text{Cos}[e+f\,x]}\ \sqrt{d\,\text{Sin}[e+f\,x]}}$$

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.2.3 (g sin)^p (a+b sin)^m (c+d sin)^n"];

Testing Rubi on 51 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.3.1 (a+b sin)^m (c+d sin)^n (A+B sin)"];

Testing Rubi on 356 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.4.1 (a+b sin)^m (A+B sin+C sin^2)"];

Testing Rubi on 19 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.4.2 (a+b sin)^m (c+d sin)^n (A+B sin+C sin^2)"];

Testing Rubi on 34 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.8 (a+b sin)^m (c+d trig)^n"];

Testing Rubi on 9 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.9 trig^m (a+b sin^n+c sin^(2 n))^p"];

Testing Rubi on 239 integration problems...

Problem #168: Unable to integrate:

$$\left\{\frac{\text{Sec}[c+d\,x]^2}{a+b\,\text{Sin}[c+d\,x]^3},\ x,\ -1,\ 0\right\}$$

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

$$\text{Int}\left[\frac{\text{Sec}[c+d\,x]^2}{a+b\,\text{Sin}[c+d\,x]^3},\ x\right]$$

Problem #170: Unable to integrate:

$$\left\{\frac{\text{Sec}[c+d\,x]^4}{a+b\,\text{Sin}[c+d\,x]^3},\ x,\ -1,\ 0\right\}$$

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

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

$$\frac{2\,b^{4/3}\,\left(a^2+2\,b^2\right)\,\text{ArcTanh}\left[\frac{b^{1/3}-(-1)^{1/3}\,a^{1/3}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{-(-1)^{2/3}\,a^{2/3}+b^{2/3}}}\right]}{3\,\sqrt{-(-1)^{2/3}\,a^{2/3}+b^{2/3}}\,\left(a^2-b^2\right)^2\,d}-\frac{2\,b^{4/3}\,\left(a^2+2\,b^2\right)\,\text{ArcTanh}\left[\frac{b^{1/3}+(-1)^{2/3}\,a^{1/3}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{(-1)^{1/3}\,a^{2/3}+b^{2/3}}}\right]}{3\,\sqrt{(-1)^{1/3}\,a^{2/3}+b^{2/3}}\,\left(a^2-b^2\right)^2\,d}+\frac{\text{Cos}[c+d\,x]}{12\,(a+b)\,d\,(1-\text{Sin}[c+d\,x])^2}+$$

$$\frac{\text{Cos}[c+d\,x]}{12\,(a+b)\,d\,(1-\text{Sin}[c+d\,x])}+\frac{(a+4\,b)\,\text{Cos}[c+d\,x]}{4\,(a+b)^2\,d\,(1-\text{Sin}[c+d\,x])}-\frac{\text{Cos}[c+d\,x]}{12\,(a-b)\,d\,(1+\text{Sin}[c+d\,x])^2}-\frac{(a-4\,b)\,\text{Cos}[c+d\,x]}{4\,(a-b)^2\,d\,(1+\text{Sin}[c+d\,x])}-\frac{\text{Cos}[c+d\,x]}{12\,(a-b)\,d\,(1+\text{Sin}[c+d\,x])}$$

$$\text{Int}\left[\frac{\text{Sec}[c+d\,x]^4}{a+b\,\text{Sin}[c+d\,x]^3},\ x\right]$$

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.10 (c+d x)^m (a+b sin)^n"];

Testing Rubi on 178 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.11 (e x)^m (a+b x^n)^p sin"];

```
Testing Rubi on 113 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.12 (e x)^m (a+b sin(c+d x^n))^p"];

Testing Rubi on 209 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1a Sine\\1.13 (d+e x)^m sin(a+b x+c x^2)^n"];

Testing Rubi on 36 integration problems...

Test complete!
```

- **1b Cosine**

```
IntegrationTest["4 Trig functions\\1b Cosine\\1.0 (a cos)^m (b trg)^n"];

Testing Rubi on 294 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.1.1 (a+b cos)^n"];

Testing Rubi on 62 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.1.2 (g sin)^p (a+b cos)^m"];

Testing Rubi on 88 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.1.3 (g tan)^p (a+b cos)^m"];

Testing Rubi on 22 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.2.1 (a+b cos)^m (c+d cos)^n"];

Testing Rubi on 936 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.2.2 (g sin)^p (a+b cos)^m (c+d cos)^n"];

Testing Rubi on 4 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.2.3 (g cos)^p (a+b cos)^m (c+d cos)^n"];
```

```
Testing Rubi on 1 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.3.1 (a+b cos)^m (c+d cos)^n (A+B cos)"];

Testing Rubi on 644 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.4.1 (a+b cos)^m (A+B cos+C cos^2)"];

Testing Rubi on 393 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.4.2 (a+b cos)^m (c+d cos)^n (A+B cos+C cos^2)"];

Testing Rubi on 1536 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.8 (a+b cos)^m (c+d trig)^n"];

Testing Rubi on 21 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.9 trig^m (a+b cos^n+c cos^(2 n))^p"];

Testing Rubi on 94 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.10 (c+d x)^m (a+b cos)^n"];

Testing Rubi on 189 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.12 (e x)^m (a+b cos(c+d x^n))^p"];

Testing Rubi on 93 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\1b Cosine\\1.13 (d+e x)^m cos(a+b x+c x^2)^n"];

Testing Rubi on 34 integration problems...

Test complete!
```

- **2a Tangent**

```
IntegrationTest["4 Trig functions\\2a Tangent\\2.0 (a trg)^m (b tan)^n"];
```

```
Testing Rubi on 352 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.1.2 (d sec)^m (a+b tan)^n"];

Testing Rubi on 700 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.1.3 (d sin)^m (a+b tan)^n"];

Testing Rubi on 93 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.2.1 (a+b tan)^m (c+d tan)^n"];

Testing Rubi on 1342 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.3.1 (a+b tan)^m (c+d tan)^n (A+B tan)"];

Testing Rubi on 859 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.4.2 (a+b tan)^m (c+d tan)^n (A+B tan+C tan^2)"];

Testing Rubi on 133 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.9 trig^m (a+b tan^n+c tan^(2 n))^p"];

Testing Rubi on 209 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.10 (c+d x)^m (a+b tan)^n"];
```

Testing Rubi on 63 integration problems...

Problem #17: Unable to integrate:

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

$$\frac{x\sqrt{\tan\left[a+b\,x^2\right]}}{b}$$

$$\text{Int}\left[\frac{x^2}{\sqrt{\tan\left[a+b\,x^2\right]}},\ x\right]+\frac{\text{Int}\left[\sqrt{\tan\left[a+b\,x^2\right]},\ x\right]}{b}+\text{Int}\left[x^2\tan\left[a+b\,x^2\right]^{3/2},\ x\right]$$

Test complete!

IntegrationTest["4 Trig functions\\2a Tangent\\2.11 (e x)^m (a+b tan(c+d x^n))^p"];

Testing Rubi on 72 integration problems...

Test complete!

- **2b Cotangent**

IntegrationTest["4 Trig functions\\2b Cotangent\\2.0 (a trg)^m (b cot)^n"];

Testing Rubi on 52 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2b Cotangent\\2.1.2 (d csc)^m (a+b cot)^n"];

Testing Rubi on 23 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2b Cotangent\\2.1.3 (d cos)^m (a+b cot)^n"];

Testing Rubi on 19 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2b Cotangent\\2.2.1 (a+b cot)^m (c+d cot)^n"];

Testing Rubi on 106 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2b Cotangent\\2.9 trig^m (a+b cot^n+c cot^(2 n))^p"];

Testing Rubi on 94 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\2b Cotangent\\2.10 (c+d x)^m (a+b cot)^n"];

Testing Rubi on 61 integration problems...

Test complete!

- **3a Secant**

IntegrationTest["4 Trig functions\\3a Secant\\3.0 (a sec)^m (b trg)^n"];

Testing Rubi on 283 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.1.2 (d sec)^n (a+b sec)^m"];

Testing Rubi on 885 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.1.3 (d sin)^n (a+b sec)^m"];

Testing Rubi on 306 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.1.4 (d tan)^n (a+b sec)^m"];

Testing Rubi on 351 integration problems...

Problem #207: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Tan}[e+f x]^2}{(a+a\,\text{Sec}[e+f x])^{9/2}}, x, -7, 7\right\}$$

$$-\frac{2\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Tan}[e+f x]}{\sqrt{a+a\,\text{Sec}[e+f x]}}\right]}{a^{9/2} f}+\frac{91\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Tan}[e+f x]}{\sqrt{2}\,\sqrt{a+a\,\text{Sec}[e+f x]}}\right]}{32\sqrt{2}\,a^{9/2} f}+\frac{\text{Tan}[e+f x]}{3\,a\,f\,(a+a\,\text{Sec}[e+f x])^{7/2}}+\frac{11\,\text{Tan}[e+f x]}{24\,a^2 f\,(a+a\,\text{Sec}[e+f x])^{5/2}}+\frac{27\,\text{Tan}[e+f x]}{32\,a^3 f\,(a+a\,\text{Sec}[e+f x])^{3/2}}$$

$$-\frac{2\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Tan}[e+f x]}{\sqrt{a+a\,\text{Sec}[e+f x]}}\right]}{a^{9/2} f}+\frac{91\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Tan}[e+f x]}{\sqrt{2}\,\sqrt{a+a\,\text{Sec}[e+f x]}}\right]}{32\sqrt{2}\,a^{9/2} f}+\frac{\text{Tan}[e+f x]}{3\,a^4 f\sqrt{a+a\,\text{Sec}[e+f x]}\left(2+\frac{\text{Tan}[e+f x]^2}{1+\text{Sec}[e+f x]}\right)^3}+$$

$$\frac{11\,\text{Tan}[e+f x]}{24\,a^4 f\sqrt{a+a\,\text{Sec}[e+f x]}\left(2+\frac{\text{Tan}[e+f x]^2}{1+\text{Sec}[e+f x]}\right)^2}+\frac{27\,\text{Tan}[e+f x]}{32\,a^4 f\sqrt{a+a\,\text{Sec}[e+f x]}\left(2+\frac{\text{Tan}[e+f x]^2}{1+\text{Sec}[e+f x]}\right)}$$

Problem #329: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cot}[c+d x]^3}{(a+b\,\text{Sec}[c+d x])^{3/2}}, x, -18, 18\right\}$$

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

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

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

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

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

Problem #333: Unable to integrate:

$$\left\{\frac{(d\,\text{Tan}[e+f\,x])^n}{a+b\,\text{Sec}[e+f\,x]},\,x,\,-1,\,0\right\}$$

$$\frac{1}{a\,f\,(1-n)}d\,\text{AppellF1}\left[1-n,\,\frac{1-n}{2},\,\frac{1-n}{2},\,2-n,\,\frac{a+b}{a+b\,\text{Sec}[e+f\,x]},\,\frac{a-b}{a+b\,\text{Sec}[e+f\,x]}\right]\left(-\frac{b\,(1-\text{Sec}[e+f\,x])}{a+b\,\text{Sec}[e+f\,x]}\right)^{\frac{1-n}{2}}\left(\frac{b\,(1+\text{Sec}[e+f\,x])}{a+b\,\text{Sec}[e+f\,x]}\right)^{\frac{1-n}{2}}(d\,\text{Tan}[e+f\,x])^{-1+n}\left(-\text{Tan}[e+f\,x]^2\right)^{\frac{1-n}{2}+\frac{1}{2}(-1+n)}-$$

$$\frac{1}{a\,f\,(1+n)}d\,\text{Hypergeometric2F1}\left[1,\,\frac{1+n}{2},\,\frac{3+n}{2},\,-\text{Tan}[e+f\,x]^2\right](d\,\text{Tan}[e+f\,x])^{-1+n}\left(-\text{Tan}[e+f\,x]^2\right)^{\frac{1-n}{2}+\frac{1+n}{2}}$$

$$\text{Int}\left[\frac{(d\,\text{Tan}[e+f\,x])^n}{a+b\,\text{Sec}[e+f\,x]},\,x\right]$$

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.2.1 (a+b sec)^m (c+d sec)^n"];

Testing Rubi on 243 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.2.3 (g sec)^p (a+b sec)^m (c+d sec)^n"];

Testing Rubi on 286 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3a Secant\\3.3.1 (a+b sec)^m (d sec)^n (A+B sec)"];

Testing Rubi on 645 integration problems...

Test complete!

```
IntegrationTest["4 Trig functions\\3a Secant\\3.4.1 (a+b sec)^m (A+B sec+C sec^2)"];
```

```
Testing Rubi on 70 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3a Secant\\3.4.2 (a+b sec)^m (d sec)^n (A+B sec+C sec^2)"];
```

```
Testing Rubi on 1373 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3a Secant\\3.7 trig^m (a+b sec^n+c sec^(2 n))^p"];
```

```
Testing Rubi on 34 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3a Secant\\3.10 (c+d x)^m (a+b sec)^n"];
```

```
Testing Rubi on 46 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3a Secant\\3.11 (e x)^m (a+b sec(c+d x^n))^p"];
```

```
Testing Rubi on 83 integration problems...
```

```
Test complete!
```

- **3b Cosecant**

```
IntegrationTest["4 Trig functions\\3b Cosecant\\3.0 (a csc)^m (b trg)^n"];
```

```
Testing Rubi on 70 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3b Cosecant\\3.1.2 (d csc)^n (a+b csc)^m"];
```

```
Testing Rubi on 59 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3b Cosecant\\3.1.3 (d cos)^n (a+b csc)^m"];
```

```
Testing Rubi on 16 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3b Cosecant\\3.1.4 (d cot)^n (a+b csc)^m"];
```

```
Testing Rubi on 23 integration problems...
```

```
Test complete!
```

```
IntegrationTest["4 Trig functions\\3b Cosecant\\3.3.1 (a+b csc)^m (d csc)^n (A+B csc)"];
```

Testing Rubi on 24 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3b Cosecant\\3.4.2 (a+b csc)^m (d csc)^n (A+B csc+C csc^2)"];

Testing Rubi on 1 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3b Cosecant\\3.7 trig^m (a+b csc^n+c csc^(2 n))^p"];

Testing Rubi on 27 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\3b Cosecant\\3.11 (e x)^m (a+b csc(c+d x^n))^p"];

Testing Rubi on 84 integration problems...

Test complete!

4 Miscellaneous trig

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.1 (c trig)^m (d trig)^n"];

Testing Rubi on 250 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.2 trig^m (a trig+b trig)^n"];

Testing Rubi on 294 integration problems...

Problem #15: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Sin}[x]^3}{(a\,\text{Cos}[x]+b\,\text{Sin}[x])^2},\ x,\ -19,\ 19\right\}$$

$$\frac{6a^2 b\,\text{ArcTanh}\left[\frac{-b+a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{5/2}}+\frac{3a\left(a^2-b^2\right)+a\left(a^2+b^2\right)\text{Cos}[2x]-b\left(a^2+b^2\right)\text{Sin}[2x]}{2\left(a^2+b^2\right)^2(a\,\text{Cos}[x]+b\,\text{Sin}[x])}$$

$$-\frac{3a^2\,\text{ArcTanh}\left[\frac{b\,\text{Cos}[x]-a\,\text{Sin}[x]}{\sqrt{a^2+b^2}}\right]}{b\left(a^2+b^2\right)^{3/2}}-\frac{2a^2 b\,\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{5/2}}+\frac{2a^2\left(3a^2+b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{b\left(a^2+b^2\right)^{5/2}}-\frac{\text{Cos}[x]}{b^2}+$$

$$\frac{3a^2\,\text{Cos}[x]}{b^2\left(a^2+b^2\right)}-\frac{2a\,\text{Sin}[x]}{b^3}+\frac{3a^3\,\text{Sin}[x]}{b^3\left(a^2+b^2\right)}-\frac{2a^3\,\text{Cos}\left[\frac{x}{2}\right]^2\left(2ab+\left(a^2-b^2\right)\text{Tan}\left[\frac{x}{2}\right]\right)}{b^3\left(a^2+b^2\right)^2}+\frac{2a^2\left(a+b\,\text{Tan}\left[\frac{x}{2}\right]\right)}{\left(a^2+b^2\right)^2\left(a+2b\,\text{Tan}\left[\frac{x}{2}\right]-a\,\text{Tan}\left[\frac{x}{2}\right]^2\right)}$$

Problem #23: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Sin}[x]^2}{(a\,\text{Cos}[x]+b\,\text{Sin}[x])^3},\ x,\ -16,\ 16\right\}$$

$$-\frac{\left(a^2-2b^2\right)\text{ArcTanh}\left[\frac{-b+a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{5/2}}+\frac{a\left(3ab\,\text{Cos}[x]+\left(a^2+4b^2\right)\text{Sin}[x]\right)}{2\left(a^2+b^2\right)^2(a\,\text{Cos}[x]+b\,\text{Sin}[x])^2}$$

$$\frac{2a^2\,\text{ArcTanh}\left[\frac{b\,\text{Cos}[x]-a\,\text{Sin}[x]}{\sqrt{a^2+b^2}}\right]}{b^2\left(a^2+b^2\right)^{3/2}}-\frac{\text{ArcTanh}\left[\frac{b\,\text{Cos}[x]-a\,\text{Sin}[x]}{\sqrt{a^2+b^2}}\right]}{b^2\sqrt{a^2+b^2}}+\frac{\left(a^2-2b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{5/2}}-\frac{2\left(a^2-b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]}{b^2\left(a^2+b^2\right)^{3/2}}+$$

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

Problem #123: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[c+dx]^3}{(a\,\text{Cos}[c+dx]+b\,\text{Sin}[c+dx])^2},\ x,\ -11,\ 11\right\}$$

$$-\frac{3ab^2\,\text{ArcTanh}\left[\frac{b\,\text{Cos}[c+dx]-a\,\text{Sin}[c+dx]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{5/2}d}+\frac{2ab\,\text{Cos}[c+dx]}{\left(a^2+b^2\right)^2d}+\frac{\left(a^2-b^2\right)\text{Sin}[c+dx]}{\left(a^2+b^2\right)^2d}-\frac{b^3}{\left(a^2+b^2\right)^2d\,(a\,\text{Cos}[c+dx]+b\,\text{Sin}[c+dx])}$$

$$\frac{2b^4\,\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{a^2+b^2}}\right]}{a\left(a^2+b^2\right)^{5/2}d}-\frac{2b^2\left(3a^2+b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{a^2+b^2}}\right]}{a\left(a^2+b^2\right)^{5/2}d}+\frac{2\left(2ab+\left(a^2-b^2\right)\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)}{\left(a^2+b^2\right)^2d\left(1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)}-\frac{2b^3\left(a+b\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)}{a\left(a^2+b^2\right)^2d\left(a+2b\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]-a\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)}$$

Problem #131: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[c+dx]^4}{(a\,\text{Cos}[c+dx]+b\,\text{Sin}[c+dx])^3},\ x,\ -15,\ 15\right\}$$

$$\frac{1}{2d}\left(-\frac{6b^2\left(-4a^2+b^2\right)\text{ArcTanh}\left[\frac{-b+a\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{7/2}}-\frac{2b\left(-3a^2+b^2\right)\text{Cos}[c+dx]}{\left(a^2+b^2\right)^3}+\right.$$

$$\left.\frac{2a\left(a^2-3b^2\right)\text{Sin}[c+dx]}{\left(a^2+b^2\right)^3}+\frac{b^4\,\text{Sin}[c+dx]}{a(a-ib)^2(a+ib)^2(a\,\text{Cos}[c+dx]+b\,\text{Sin}[c+dx])^2}-\frac{b^3\left(8a^2+b^2\right)}{a\left(a^2+b^2\right)^3(a\,\text{Cos}[c+dx]+b\,\text{Sin}[c+dx])}\right)$$

$$-\frac{3\,b^4\left(a^2+2\,b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^2\left(a^2+b^2\right)^{7/2}d}+\frac{4\,b^4\left(3\,a^2+2\,b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^2\left(a^2+b^2\right)^{7/2}d}-\frac{2\,b^2\left(6\,a^4+3\,a^2\,b^2+b^4\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^2\left(a^2+b^2\right)^{7/2}d}+\frac{2\left(b\left(3\,a^2-b^2\right)+a\left(a^2-3\,b^2\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)}{\left(a^2+b^2\right)^3 d\left(1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)}+$$

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

Problem #133: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[c+d\,x]^2}{(a\,\text{Cos}[c+d\,x]+b\,\text{Sin}[c+d\,x])^3},\ x,\ -9,\ 9\right\}$$

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

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

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

Problem #142: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[c+d\,x]^3}{(a\,\text{Cos}[c+d\,x]+b\,\text{Sin}[c+d\,x])^4},\ x,\ -13,\ 13\right\}$$

$$\frac{a\left(2\,a^2-3\,b^2\right)\text{ArcTanh}\left[\frac{-b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{\left(a^2+b^2\right)^{7/2}d}+$$

$$\left(-3\left(3\,a^4\,b-a^2\,b^3+b^5\right)\text{Cos}[2\,(c+d\,x)]+\frac{1}{2}b\left(-9\,a^2+b^2\right)\left(2\left(a^2+b^2\right)+3\,a\,b\,\text{Sin}[2\,(c+d\,x)]\right)\right)\Big/\left(6\,(a-i\,b)^3\,(a+i\,b)^3\,d\,(a\,\text{Cos}[c+d\,x]+b\,\text{Sin}[c+d\,x])^3\right)$$

$$\frac{6\,b^2\left(a^2-2\,b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^3\left(a^2+b^2\right)^{5/2}d}-\frac{2\left(a^2-2\,b^2\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^3\left(a^2+b^2\right)^{3/2}d}-\frac{b^2\left(3\,a^4-8\,b^4\right)\text{ArcTanh}\left[\frac{b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2+b^2}}\right]}{a^3\left(a^2+b^2\right)^{7/2}d}-$$

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

$$\frac{b^2\left(3\,a^4-8\,b^4\right)\left(b-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)}{a^4\left(a^2+b^2\right)^3d\left(a+2\,b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)}-\frac{2\,b\left(6\,a^4-13\,a^2\,b^2+8\,b^4+9\,a\,b\left(a^2-2\,b^2\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)}{3\,a^4\left(a^2+b^2\right)^2d\left(a+2\,b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)}$$

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.3 (c+d x)^m trig^n trig^p"];

Testing Rubi on 397 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.4 x^m (a+b trig^n)^p"];

Testing Rubi on 9 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.5 x^m trig(a+b log(c x^n))^p"];

Testing Rubi on 268 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.6 f^(a+b x+c x^2) trig(d+e x+f x^2)^n"];

Testing Rubi on 132 integration problems...

Test complete!

IntegrationTest["4 Trig functions\\4 Miscellaneous\\4.7 Trig functions"];

Testing Rubi on 881 integration problems...

Problem #690: Valid but suboptimal antiderivative:

$$\left\{\text{Cos}[x]^{12}\,\text{Sin}[x]^{10}-\text{Cos}[x]^{10}\,\text{Sin}[x]^{12},\,x,\,-25,\,25\right\}$$

$$\frac{1}{11}\text{Cos}[x]^{11}\,\text{Sin}[x]^{11}$$

$$\frac{3\,\text{Cos}[x]^{11}\,\text{Sin}[x]}{5632}-\frac{3\,\text{Cos}[x]^{13}\,\text{Sin}[x]}{5632}+\frac{1}{512}\text{Cos}[x]^{11}\,\text{Sin}[x]^3-\frac{7\,\text{Cos}[x]^{13}\,\text{Sin}[x]^3}{2816}+\frac{7\,\text{Cos}[x]^{11}\,\text{Sin}[x]^5}{1280}-$$

$$\frac{7}{880}\text{Cos}[x]^{13}\,\text{Sin}[x]^5+\frac{1}{80}\text{Cos}[x]^{11}\,\text{Sin}[x]^7-\frac{9}{440}\text{Cos}[x]^{13}\,\text{Sin}[x]^7+\frac{1}{40}\text{Cos}[x]^{11}\,\text{Sin}[x]^9-\frac{1}{22}\text{Cos}[x]^{13}\,\text{Sin}[x]^9+\frac{1}{22}\text{Cos}[x]^{11}\,\text{Sin}[x]^{11}$$

Problem #727: Unable to integrate:

$$\left\{e^{\text{Sin}[x]}\,\text{Sec}[x]^2\,\left(x\,\text{Cos}[x]^3-\text{Sin}[x]\right),\,x,\,-2,\,2\right\}$$

$$e^{\text{Sin}[x]}\,\left(-1+x\,\text{Cos}[x]\right)\,\text{Sec}[x]$$

$$\text{Int}\left[e^{\text{Sin}[x]}\,x\,\text{Cos}[x],\,x\right]-\text{Int}\left[e^{\text{Sin}[x]}\,\text{Sec}[x]\,\text{Tan}[x],\,x\right]$$

Problem #789: Valid but suboptimal antiderivative:

$$\left\{\frac{1}{\text{Cos}[x]^{3/2}\,\sqrt{3\,\text{Cos}[x]+\text{Sin}[x]}},\,x,\,-5,\,5\right\}$$

$$\frac{2\,\sqrt{3\,\text{Cos}[x]+\text{Sin}[x]}}{\sqrt{\text{Cos}[x]}}$$

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

Problem #790: Unable to integrate:

$$\left\{\frac{\text{Csc}[x]\,\sqrt{\text{Cos}[x]+\text{Sin}[x]}}{\text{Cos}[x]^{3/2}},\,x,\,-1,\,0\right\}$$

$$-\text{Log}[\text{Sin}[x]]+2\,\text{Log}\left[-\sqrt{\text{Cos}[x]}+\sqrt{\text{Cos}[x]+\text{Sin}[x]}\,\right]+\frac{2\,\sqrt{\text{Cos}[x]+\text{Sin}[x]}}{\sqrt{\text{Cos}[x]}}$$

$$\text{Int}\left[\frac{\text{Csc}[x]\,\sqrt{\text{Cos}[x]+\text{Sin}[x]}}{\text{Cos}[x]^{3/2}},\,x\right]$$

Problem #791: Valid but suboptimal antiderivative:

$$\left\{\frac{\text{Cos}[x]+\text{Sin}[x]}{\sqrt{1+\text{Sin}[2\,x]}},\,x,\,-19,\,19\right\}$$

$$\frac{x\,\sqrt{1+\text{Sin}[2\,x]}}{\text{Cos}[x]+\text{Sin}[x]}$$

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

Problem #843: Valid but suboptimal antiderivative:

$$\left\{\frac{\cos[x]+\sin[x]}{\sqrt{\cos[x]}\,\sqrt{\sin[x]}},\ x,\ -26,\ 26\right\}$$

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

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

$$\frac{\text{Log}\left[1+\cot[x]-\frac{\sqrt{2}\,\sqrt{\cos[x]}}{\sqrt{\sin[x]}}\right]}{2\sqrt{2}}+\frac{\text{Log}\left[1+\cot[x]+\frac{\sqrt{2}\,\sqrt{\cos[x]}}{\sqrt{\sin[x]}}\right]}{2\sqrt{2}}+\frac{\text{Log}\left[1-\frac{\sqrt{2}\,\sqrt{\sin[x]}}{\sqrt{\cos[x]}}+\tan[x]\right]}{2\sqrt{2}}-\frac{\text{Log}\left[1+\frac{\sqrt{2}\,\sqrt{\sin[x]}}{\sqrt{\cos[x]}}+\tan[x]\right]}{2\sqrt{2}}$$

Problem #846: Unable to integrate:

$$\left\{\cos\left[\frac{x}{2}\right]^2\tan\left[\frac{\pi}{4}+\frac{x}{2}\right],\ x,\ -1,\ 0\right\}$$

$$\frac{x}{2}-\frac{\cos[x]}{2}-\text{Log}\left[\cos\left[\frac{\pi}{4}+\frac{x}{2}\right]\right]$$

$$\text{Int}\left[\cos\left[\frac{x}{2}\right]^2\tan\left[\frac{\pi}{4}+\frac{x}{2}\right],\ x\right]$$

Problem #862: Unable to integrate:

$$\left\{\frac{x^4}{b\sqrt{x^3+3\sin[a+bx]}}+\frac{x^2\cos[a+bx]}{\sqrt{x^3+3\sin[a+bx]}}+\frac{4x\sqrt{x^3+3\sin[a+bx]}}{3b},\ x,\ -1,\ 1\right\}$$

$$\frac{2x^2\sqrt{x^3+3\sin[a+bx]}}{3b}$$

$$\frac{\text{Int}\left[\frac{x^4}{\sqrt{x^3+3\sin[a+bx]}},\ x\right]}{b}+\text{Int}\left[\frac{x^2\cos[a+bx]}{\sqrt{x^3+3\sin[a+bx]}},\ x\right]+\frac{4\,\text{Int}\left[x\sqrt{x^3+3\sin[a+bx]},\ x\right]}{3b}$$

Problem #864: Unable to integrate:

$$\left\{\frac{\cos[x]+\sin[x]}{e^{-x}+\sin[x]},\ x,\ -5,\ 5\right\}$$

$$\text{Log}[1+e^x\sin[x]]$$

$$x + \text{Log}[\text{Sin}[x]] - \text{Int}\left[\frac{1}{1 + e^x \text{Sin}[x]}, x\right] - \text{Int}\left[\frac{\text{Cot}[x]}{1 + e^x \text{Sin}[x]}, x\right]$$

Test complete!

---

5 Inverse trig functions

- **Inverse sine**

IntegrationTest["5 Inverse trig functions\\1a Inverse sine\\1.2 (d x)^m (a+b arcsin(c x))^n"];

Testing Rubi on 227 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\1a Inverse sine\\1.4a (f x)^m (d-c^2 d x^2)^p (a+b arcsin(c x))^n"];

Testing Rubi on 502 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\1a Inverse sine\\1.4b (f x)^m (d+e x^2)^p (a+b arcsin(c x))^n"];

Testing Rubi on 109 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\1a Inverse sine\\1.5 Inverse sine functions"];

Testing Rubi on 495 integration problems...

Problem #493: Unable to integrate:

$$\left\{\frac{x}{\text{ArcSin}[\text{Sin}[x]]}, x, -1, 0\right\}$$

$$\text{ArcSin}[\text{Sin}[x]] + \text{Log}[\text{ArcSin}[\text{Sin}[x]]]\left(-\text{ArcSin}[\text{Sin}[x]] + x\sqrt{\text{Cos}[x]^2}\,\text{Sec}[x]\right)$$

$$\text{Int}\left[\frac{x}{\text{ArcSin}[\text{Sin}[x]]}, x\right]$$

Test complete!

- **Inverse cosine**

IntegrationTest["5 Inverse trig functions\\1b Inverse cosine\\1.2 (d x)^m (a+b arccos(c x))^n"];

Testing Rubi on 227 integration problems...

Test complete!

IntegrationTest["5 Inverse Trig functions\\1b Inverse cosine\\1.5 Inverse cosine functions"];

Testing Rubi on 136 integration problems...

Test complete!

- **Inverse tangent**

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.1.1 (d x)^m (a+b arctan(c x))^n"];

Testing Rubi on 57 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.1.2 (f x)^m (d-c^2 d x^2)^p (a+b arctan(c x))^n"];

Testing Rubi on 994 integration problems...

Problem #973: Unable to integrate:

$$\left\{\frac{\text{ArcTan}[x]\,\text{Log}\left[1+x^2\right]}{x},\ x,\ -1,\ 0\right\}$$

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

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

Test complete!

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.1.3 (f x)^m (d+e x^2)^p (a+b arctan(c x))^n"];

Testing Rubi on 132 integration problems...

Problem #24: Valid but suboptimal antiderivative:

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

$$\frac{b\left(10\,c^6\,d^3-20\,c^4\,d^2\,e+15\,c^2\,d\,e^2-4\,e^3\right)x}{40\,c^9}-\frac{b\left(10\,c^6\,d^3-20\,c^4\,d^2\,e+15\,c^2\,d\,e^2-4\,e^3\right)x^3}{120\,c^7}-\frac{b\,e\left(20\,c^4\,d^2-15\,c^2\,d\,e+4\,e^2\right)x^5}{200\,c^5}-$$
$$\frac{b\left(15\,c^2\,d-4\,e\right)e^2\,x^7}{280\,c^3}-\frac{b\,e^3\,x^9}{90\,c}+\frac{b\left(c^2\,d-e\right)^4\left(c^2\,d+4\,e\right)\text{ArcTan}[c\,x]}{40\,c^{10}\,e^2}-\frac{d\left(d+e\,x^2\right)^4(a+b\,\text{ArcTan}[c\,x])}{8\,e^2}+\frac{\left(d+e\,x^2\right)^5(a+b\,\text{ArcTan}[c\,x])}{10\,e^2}$$
$$\frac{b\left(325\,c^8\,d^4+1815\,c^6\,d^3\,e-4977\,c^4\,d^2\,e^2+4305\,c^2\,d\,e^3-1260\,e^4\right)x}{12\,600\,c^9\,e}+\frac{b\left(5\,c^6\,d^3+750\,c^4\,d^2\,e-1071\,c^2\,d\,e^2+420\,e^3\right)x\left(d+e\,x^2\right)}{12\,600\,c^7\,e}-\frac{b\left(25\,c^4\,d^2-135\,c^2\,d\,e+84\,e^2\right)x\left(d+e\,x^2\right)^2}{4200\,c^5\,e}-$$
$$\frac{b\left(23\,c^2\,d-36\,e\right)x\left(d+e\,x^2\right)^3}{2520\,c^3\,e}-\frac{b\,x\left(d+e\,x^2\right)^4}{90\,c\,e}+\frac{b\left(c^2\,d-e\right)^4\left(c^2\,d+4\,e\right)\text{ArcTan}[c\,x]}{40\,c^{10}\,e^2}-\frac{d\left(d+e\,x^2\right)^4(a+b\,\text{ArcTan}[c\,x])}{8\,e^2}+\frac{\left(d+e\,x^2\right)^5(a+b\,\text{ArcTan}[c\,x])}{10\,e^2}$$

Test complete!

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.1.4 Inverse tangent functions"];

Testing Rubi on 217 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.2.1 x^m (c+a^2 c x^2)^p E^(n arctan(a x))"];

Testing Rubi on 142 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\2a Inverse tangent\\2.2.2 Exponentials of inverse tangent"];

Testing Rubi on 242 integration problems...

Test complete!

- **Inverse cotangent**

IntegrationTest["5 Inverse trig functions\\2b Inverse cotangent\\2.1 Inverse cotangent functions"];

Testing Rubi on 228 integration problems...

Test complete!

IntegrationTest["5 Inverse trig functions\\2b Inverse cotangent\\2.2 Exponentials of inverse cotangent"];

Testing Rubi on 12 integration problems...

Test complete!

- **Inverse secant**

IntegrationTest["5 Inverse trig functions\\3a Inverse secant\\3.1 Inverse secant functions"];

```
Testing Rubi on 166 integration problems...

Test complete!
```

- **Inverse cosecant**

```
IntegrationTest["5 Inverse trig functions\\3b Inverse cosecant\\3.1 Inverse cosecant functions"];

Testing Rubi on 87 integration problems...

Test complete!
```

---

6 Hyperbolic functions

- **1a Hyperbolic sine**

```
IntegrationTest["6 Hyperbolic functions\\1a Hyperbolic sine\\1.1 (c+d x)^m (a+b sinh)^n"];

Testing Rubi on 186 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\1a Hyperbolic sine\\1.3 (e x)^m (a+b sinh(c+d x^n))^p"];

Testing Rubi on 96 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\1a Hyperbolic sine\\1.4 (d+e x)^m sinh(a+b x+c x^2)^n"];

Testing Rubi on 33 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\1a Hyperbolic sine\\1.5 Hyperbolic sine functions"];

Testing Rubi on 694 integration problems...

Test complete!
```

- **1b Hyperbolic cosine**

```
IntegrationTest["6 Hyperbolic functions\\1b Hyperbolic cosine\\1.1 (c+d x)^m (a+b cosh)^n"];

Testing Rubi on 183 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\1b Hyperbolic cosine\\1.2 (e x)^m (a+b x^n)^p cosh"];

Testing Rubi on 113 integration problems...

Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\1b Hyperbolic cosine\\1.3 (e x)^m (a+b cosh(c+d x^n))^p"];
```

```
Testing Rubi on 62 integration problems...
```

```
Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\1b Hyperbolic cosine\\1.4 (d+e x)^m cosh(a+b x+c x^2)^n"];
```

```
Testing Rubi on 33 integration problems...
```

```
Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\1b Hyperbolic cosine\\1.5 Hyperbolic cosine functions"];
```

```
Testing Rubi on 407 integration problems...
```

```
Test complete!
```

- **2a Hyperbolic tangent**

```
IntegrationTest["6 Hyperbolic functions\\2a Hyperbolic tangent\\2.1 (c+d x)^m (a+b tanh)^n"];
```

```
Testing Rubi on 79 integration problems...
```

```
Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\2a Hyperbolic tangent\\2.2 Hyperbolic tangent functions"];
```

```
Testing Rubi on 461 integration problems...
```

```
Test complete!
```

- **2b Hyperbolic cotangent**

```
IntegrationTest["6 Hyperbolic functions\\2b Hyperbolic cotangent\\2.1 (c+d x)^m (a+b coth)^n"];
```

```
Testing Rubi on 61 integration problems...
```

```
Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\2b Hyperbolic cotangent\\2.2 Hyperbolic cotangent functions"];
```

```
Testing Rubi on 228 integration problems...
```

```
Test complete!
```

- **3a Hyperbolic secant**

```
IntegrationTest["6 Hyperbolic functions\\3a Hyperbolic secant\\3.1 (c+d x)^m (a+b sech)^n"];
```

```
Testing Rubi on 16 integration problems...
```

```
Test complete!
```

```
IntegrationTest["6 Hyperbolic functions\\3a Hyperbolic secant\\3.2 (e x)^m (a+b sech(c+d x^n))^p"];
```

```
Testing Rubi on 84 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\3a Hyperbolic secant\\3.3 Hyperbolic secant functions"];

Testing Rubi on 394 integration problems...

Test complete!
```

- **3b Hyperbolic cosecant**

```
IntegrationTest["6 Hyperbolic functions\\3b Hyperbolic cosecant\\3.1 (c+d x)^m (a+b csch)^n"];

Testing Rubi on 16 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\3b Hyperbolic cosecant\\3.2 (e x)^m (a+b csch(c+d x^n))^p"];

Testing Rubi on 83 integration problems...

Test complete!

IntegrationTest["6 Hyperbolic functions\\3b Hyperbolic cosecant\\3.3 Hyperbolic cosecant functions"];

Testing Rubi on 195 integration problems...

Test complete!
```

- **4 Miscellaneous hyperbolic trig**

```
IntegrationTest["6 Hyperbolic functions\\4 Miscellaneous\\4.1 Hyperbolic functions"];

Testing Rubi on 1055 integration problems...

Test complete!
```

7 Inverse hyperbolic functions

- **Inverse hyperbolic sine**

```
IntegrationTest["7 Inverse hyperbolic functions\\1a Inverse hyperbolic sine\\1.2 (d x)^m (a+b arcsinh(c x))^n"];

Testing Rubi on 156 integration problems...

Test complete!

IntegrationTest["7 Inverse hyperbolic functions\\1a Inverse hyperbolic sine\\1.4a (f x)^m (d+c^2 d x^2)^p (a+b arcsinh(c x))^n"];

Testing Rubi on 469 integration problems...

Test complete!
```

```
IntegrationTest["7 Inverse hyperbolic functions\\1a Inverse hyperbolic sine\\1.4b (f x)^m (d+e x^2)^p (a+b arcsinh(c x))^n"];
```

```
Testing Rubi on 58 integration problems...
```

```
Test complete!
```

```
IntegrationTest["7 Inverse hyperbolic functions\\1a Inverse hyperbolic sine\\1.5 Inverse hyperbolic sine functions"];
```

```
Testing Rubi on 371 integration problems...
```

```
Problem #369: Unable to integrate:
```

$$\left\{\frac{x}{\text{ArcSinh}[\text{Sinh}[x]]}, x, -1, 0\right\}$$

$$\text{ArcSinh}[\text{Sinh}[x]] + \text{Log}[\text{ArcSinh}[\text{Sinh}[x]]]\left(-\text{ArcSinh}[\text{Sinh}[x]] + x\sqrt{\text{Cosh}[x]^2}\ \text{Sech}[x]\right)$$

$$\text{Int}\left[\frac{x}{\text{ArcSinh}[\text{Sinh}[x]]}, x\right]$$

```
Test complete!
```

- **Inverse hyperbolic cosine**

```
IntegrationTest["7 Inverse hyperbolic functions\\1b Inverse hyperbolic cosine\\1.2 (d x)^m (a+b arccosh(c x))^n"];
```

```
Testing Rubi on 166 integration problems...
```

```
Test complete!
```

```
IntegrationTest["7 Inverse hyperbolic functions\\1b Inverse hyperbolic cosine\\1.4a (f x)^m (d-c^2 d x^2)^p (a+b arccosh(c x))^n"];
```

```
Testing Rubi on 453 integration problems...
```

```
Test complete!
```

```
IntegrationTest["7 Inverse hyperbolic functions\\1b Inverse hyperbolic cosine\\1.4b (f x)^m (d+e x^2)^p (a+b arccosh(c x))^n"];
```

```
Testing Rubi on 109 integration problems...
```

```
Test complete!
```

```
IntegrationTest["7 Inverse hyperbolic functions\\1b Inverse hyperbolic cosine\\1.5 Inverse hyperbolic cosine functions"];
```

```
Testing Rubi on 293 integration problems...
```

```
Test complete!
```

- **Inverse hyperbolic tangent**

```
IntegrationTest["7 Inverse hyperbolic functions\\2a Inverse hyperbolic tangent\\2.1 Inverse hyperbolic tangent functions"];
```

```
Testing Rubi on 800 integration problems...

Problem #436: Unable to integrate:
```

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

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

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

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

$$\text{Subst}\left[\text{Int}\left[\frac{\text{ArcTanh}[x]^2}{-a+x},\ x\right],\ x,\ a+b\,x\right]$$

```
Test complete!

IntegrationTest["7 Inverse hyperbolic functions\\2a Inverse hyperbolic tangent\\2.2.1 x^m (c-a^2 c x^2)^p E^(n arctanh(a x))"];

Testing Rubi on 496 integration problems...

Test complete!

IntegrationTest["7 Inverse hyperbolic functions\\2a Inverse hyperbolic tangent\\2.2.2 Exponentials of inverse hyperbolic tangent functions"];

Testing Rubi on 881 integration problems...

Test complete!
```

- **Inverse hyperbolic cotangent**

```
IntegrationTest["7 Inverse hyperbolic functions\\2b Inverse hyperbolic cotangent\\2.1 Inverse hyperbolic cotangent functions"];
```

```
Testing Rubi on 253 integration problems...

Problem #72: Unable to integrate:
```

$$\left\{\frac{\text{ArcCoth}[a+b\,x]^2}{x},\ x,\ -3,\ 3\right\}$$

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

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

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

$$\text{Subst}\left[\text{Int}\left[\frac{\text{ArcCoth}[x]^2}{-a+x},\ x\right],\ x,\ a+b\,x\right]$$

```
Test complete!

IntegrationTest["7 Inverse hyperbolic functions\\2b Inverse hyperbolic cotangent\\2.2 Exponentials of inverse hyperbolic cotangent functions"];

Testing Rubi on 935 integration problems...

Test complete!
```

- **Inverse hyperbolic secant**

```
IntegrationTest["7 Inverse hyperbolic functions\\3a Inverse hyperbolic secant\\3.1 Inverse hyperbolic secant functions"];
```

```
Testing Rubi on 120 integration problems...

Problem #117: Unable to integrate:
```

$$\left\{\frac{x\left(-1+a\,e^{\text{ArcSech}[a\,x]}\,x\right)}{1-a^2\,x^2},\ x,\ -10,\ 10\right\}$$

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

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

```
Test complete!
```

- **Inverse hyperbolic cosecant**

```
IntegrationTest["7 Inverse hyperbolic functions\\3b Inverse hyperbolic cosecant\\3.1 Inverse hyperbolic cosecant functions"];

Testing Rubi on 63 integration problems...

Test complete!
```

8 Special functions

```
IntegrationTest["8 Special functions\\8.1 Error functions"];

Testing Rubi on 115 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.2 Fresnel integral functions"];

Testing Rubi on 126 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.3 Exponential integral functions"];

Testing Rubi on 149 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.4 Trig integral functions"];

Testing Rubi on 122 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.5 Hyperbolic integral functions"];
```

```
Testing Rubi on 122 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.6 Gamma functions"];

Testing Rubi on 168 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.7 Zeta function"];

Testing Rubi on 14 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.8 Polylogarithm function"];

Testing Rubi on 27 integration problems...

Test complete!

IntegrationTest["8 Special functions\\8.9 Product logarithm function"];

Testing Rubi on 396 integration problems...

Test complete!
```

Test suite statistics

```
PrintTestStatistics[];

              * * *  Indefinite Integration Test Suite Results  * * *


 Integration function:  Rubi 4's user-defined Int function

Time and date of test:  17:46  07 March 2010

  Mathematica version:  11.0.1 for Microsoft Windows (64-bit) (September 20, 2016)


Integration rules defined: 5976

Integration rules applied: 370259

Maximum steps used: 547 steps   Optimal steps: 547 steps   Integrand: x^3 (c + a^2 c x^2)^(5/2) ArcTan[a x]^3

Largest result size: 3205 leaves   Optimal size: 3205 leaves   Integrand: x^3/(a + b Csc[c + d Sqrt[x]])^2
```

Longest compute time: 33.6026 seconds Result size: 1326 leaves Integrand: $\frac{(c+d\,\mathrm{Tan}[e+f\,x])^{5/2}\,\left(A+B\,\mathrm{Tan}[e+f\,x]+C\,\mathrm{Tan}[e+f\,x]^2\right)}{(a+b\,\mathrm{Tan}[e+f\,x])^{7/2}}$

File	Optimal	Nonident	Unintegrable	Timeout	Invalid	Total	Int/sec	Time
0 Independent test suites\Apostol Problems	175	0	0	0	0	175	39.10	4.7
0 Independent test suites\Moses Problems	113	0	0	0	0	113	31.50	3.7
0 Independent test suites\Timofeev Problems	687	17	1	0	0	705	5.50	179.5
0 Independent test suites\Charlwood Problems	42	5	2	0	1	50	4.17	114.9
0 Independent test suites\Stewart Problems	376	0	0	0	0	376	33.80	11.4
0 Independent test suites\Hearn Problems	278	0	6	0	0	284	9.36	30.7
0 Independent test suites\Jeffrey Problems	4	3	2	0	0	9	0.79	11.8
0 Independent test suites\Hebisch Problems	3	0	4	0	0	7	2.80	2.7
0 Independent test suites\Wester Problems	8	0	0	0	0	8	32.10	0.3
0 Independent test suites\Welz Problems	47	8	8	0	0	63	1.03	74.8
0 Independent test suites\Bronstein Problems	12	0	2	0	0	14	5.37	2.7
0 Independent test suites\Bondarenko Problems	32	3	0	0	0	35	1.45	30.7
1 Algebraic functions\1 Linear products\1.2 (a+b x)^m (c+d x)^n	1567	1	0	0	0	1568	4.72	336.5
1 Algebraic functions\1 Linear products\1.3 (a+b x)^m (c+d x)^n (e+f x)^p	3127	2	0	0	0	3129	3.92	804.7
1 Algebraic functions\1 Linear products\1.4 (a+b x)^m (c+d x)^n (e+f x)^p (g+h x)^q	81	0	0	0	0	81	1.45	56.4
1 Algebraic functions\2 Quadratic products\2.2 (d+e x)^m (a+b x+c x^2)^p	2998	0	0	0	0	2998	2.47	1228.8
1 Algebraic functions\2 Quadratic products\2.3 (d+e x)^m (f+g x)^n (a+b x+c x^2)^p	3198	1	0	0	0	3199	1.98	1632.2
1 Algebraic functions\2 Quadratic products\2.4 (a+b x+c x^2)^p (d+e x+f x^2)^q	168	0	0	0	0	168	1.26	134.4
1 Algebraic functions\2 Quadratic products\2.5 (g+h x)^m (a+b x+c x^2)^p (d+e x+f x^2)^q	227	0	0	0	0	227	0.52	443.9
1 Algebraic functions\2 Quadratic products\2.6 (a+b x+c x^2)^p (d+e x+f x^2)^q (A+B x+C x^2)	33	0	0	0	0	33	2.68	12.5
1 Algebraic functions\3 Binomial products\3.2 (c x)^m (a+b x^n)^p	3907	5	0	0	0	3912	9.33	424.2
1 Algebraic functions\3 Binomial products\3.3 (a+b x^n)^p (c+d x^n)^q	568	1	0	0	0	569	2.50	230.2
1 Algebraic functions\3 Binomial products\3.4 (e x)^m (a+b x^n)^p (c+d x^n)^q	1795	0	0	0	0	1795	2.21	819.4
1 Algebraic functions\3 Binomial products\3.5 (a+b x^n)^p (c+d x^n)^q (e+f x^n)^r	115	0	0	0	0	115	1.37	84.5
1 Algebraic functions\3 Binomial products\3.6 (g x)^m (a+b x^n)^p (c+d x^n)^q (e+f x^n)^r	97	0	0	0	0	97	1.07	90.8
1 Algebraic functions\3 Binomial products\3.7 (c x)^m Pq(x) (a+b x^n)^p	561	0	0	0	0	561	1.71	331.6
1 Algebraic functions\3 Binomial products\3.9 (c x)^m (a x^j+b x^n)^p	454	0	0	0	0	454	4.61	99.5
1 Algebraic functions\3 Binomial products\3.10 (e x)^m (a x^j+b x^k)^p (c+d x^n)^q	295	0	0	0	0	295	3.38	87.7
1 Algebraic functions\4 Trinomial products\4.2 (d x)^m (a+b x^n+c x^(2 n))^p	1761	1	0	0	0	1762	3.11	575.9
1 Algebraic functions\4 Trinomial products\4.3 (d+e x^n)^q (a+b x^n+c x^(2 n))^p	341	0	0	0	0	341	1.45	238.8
1 Algebraic functions\4 Trinomial products\4.4 (f x)^m (d+e x^n)^q (a+b x^n+c x^(2 n))^p	435	1	0	0	0	436	0.92	479.5
1 Algebraic functions\4 Trinomial products\4.5 (d x)^m Pq(x) (a+b x^n+c x^(2 n))^p	177	0	0	0	0	177	0.66	272.7
1 Algebraic functions\4 Trinomial products\4.7 (d x)^m (a x^q+b x^n+c x^(2 n-q))^p	122	0	0	0	0	122	2.47	50.5
1 Algebraic functions\5 Miscellaneous\5.1 Rational functions	266	1	2	0	0	269	6.37	42.9
1 Algebraic functions\5 Miscellaneous\5.2 Algebraic functions	709	4	4	0	0	717	4.46	162.3
1 Algebraic functions\5 Miscellaneous\5.3 Expansion problems	110	0	0	0	0	110	6.27	17.7
1 Algebraic functions\5 Miscellaneous\5.4 Substitution problems	361	3	0	0	0	364	3.59	103.0
1 Algebraic functions\5 Miscellaneous\5.5 Piecewise constant extraction	66	0	0	0	0	66	5.77	11.6
1 Algebraic functions\5 Miscellaneous\5.6 Derivative integration problems	95	0	2	0	0	97	15.40	6.4
2 Exponentials\2.1 u (F^(c (a+b x)))^n	98	0	0	0	0	98	3.61	27.4
2 Exponentials\2.2 (c+d x)^m (F^(g (e+f x)))^n (a+b (F^(g (e+f x)))^n)^p	88	0	0	0	0	88	3.22	27.4
2 Exponentials\2.3 Exponential functions	722	0	4	0	0	726	5.26	139.1
3 Logarithms\3.1 u (a+b log(c (d (e+f x)^p)^q))^n	280	0	0	0	0	280	1.41	200.2
3 Logarithms\3.2 Logarithm functions	805	0	1	0	0	806	4.57	178.2
4 Trig functions\1a Sine\1.0 (a sin)^m (b trg)^n	538	0	0	0	0	538	11.50	47.4
4 Trig functions\1a Sine\1.1.1 (a+b sin)^n	64	0	0	0	0	64	8.73	7.4
4 Trig functions\1a Sine\1.1.2 (g cos)^p (a+b sin)^m	652	1	0	0	0	653	2.48	277.0

4 Trig functions\1a Sine\1.1.3 (g tan)^p (a+b sin)^m	208	0	0	0	0	208	2.92	71.9
4 Trig functions\1a Sine\1.2.1 (a+b sin)^m (c+d sin)^n	837	0	0	0	0	837	1.91	440.7
4 Trig functions\1a Sine\1.2.2 (g cos)^p (a+b sin)^m (c+d sin)^n	1561	1	0	0	0	1562	2.06	766.0
4 Trig functions\1a Sine\1.2.3 (g sin)^p (a+b sin)^m (c+d sin)^n	51	0	0	0	0	51	2.47	20.8
4 Trig functions\1a Sine\1.3.1 (a+b sin)^m (c+d sin)^n (A+B sin)	356	0	0	0	0	356	1.79	200.3
4 Trig functions\1a Sine\1.4.1 (a+b sin)^m (A+B sin+C sin^2)	19	0	0	0	0	19	5.54	3.5
4 Trig functions\1a Sine\1.4.2 (a+b sin)^m (c+d sin)^n (A+B sin+C sin^2)	34	0	0	0	0	34	0.95	36.2
4 Trig functions\1a Sine\1.8 (a+b sin)^m (c+d trig)^n	9	0	0	0	0	9	4.89	1.9
4 Trig functions\1a Sine\1.9 trig^m (a+b sin^n+c sin^(2 n))^p	237	0	2	0	0	239	2.68	90.7
4 Trig functions\1a Sine\1.10 (c+d x)^m (a+b sin)^n	178	0	0	0	0	178	3.05	59.1
4 Trig functions\1a Sine\1.11 (e x)^m (a+b x^n)^p sin	113	0	0	0	0	113	0.88	130.5
4 Trig functions\1a Sine\1.12 (e x)^m (a+b sin(c+d x^n))^p	209	0	0	0	0	209	4.00	53.3
4 Trig functions\1a Sine\1.13 (d+e x)^m sin(a+b x+c x^2)^n	36	0	0	0	0	36	4.69	7.8
4 Trig functions\1b Cosine\1.0 (a cos)^m (b trg)^n	294	0	0	0	0	294	17.50	17.0
4 Trig functions\1b Cosine\1.1.1 (a+b cos)^n	62	0	0	0	0	62	10.20	6.2
4 Trig functions\1b Cosine\1.1.2 (g sin)^p (a+b cos)^m	88	0	0	0	0	88	1.23	72.8
4 Trig functions\1b Cosine\1.1.3 (g tan)^p (a+b cos)^m	22	0	0	0	0	22	5.90	3.8
4 Trig functions\1b Cosine\1.2.1 (a+b cos)^m (c+d cos)^n	936	0	0	0	0	936	2.81	335.2
4 Trig functions\1b Cosine\1.2.2 (g sin)^p (a+b cos)^m (c+d cos)^n	4	0	0	0	0	4	1.15	3.5
4 Trig functions\1b Cosine\1.2.3 (g cos)^p (a+b cos)^m (c+d cos)^n	1	0	0	0	0	1	4.93	0.2
4 Trig functions\1b Cosine\1.3.1 (a+b cos)^m (c+d cos)^n (A+B cos)	644	0	0	0	0	644	1.32	492.0
4 Trig functions\1b Cosine\1.4.1 (a+b cos)^m (A+B cos+C cos^2)	393	0	0	0	0	393	5.25	75.7
4 Trig functions\1b Cosine\1.4.2 (a+b cos)^m (c+d cos)^n (A+B cos+C cos^2)	1536	0	0	0	0	1536	0.98	1569.6
4 Trig functions\1b Cosine\1.8 (a+b cos)^m (c+d trig)^n	21	0	0	0	0	21	2.19	10.0
4 Trig functions\1b Cosine\1.9 trig^m (a+b cos^n+c cos^(2 n))^p	94	0	0	0	0	94	1.50	63.8
4 Trig functions\1b Cosine\1.10 (c+d x)^m (a+b cos)^n	189	0	0	0	0	189	4.03	47.3
4 Trig functions\1b Cosine\1.12 (e x)^m (a+b cos(c+d x^n))^p	93	0	0	0	0	93	5.03	18.7
4 Trig functions\1b Cosine\1.13 (d+e x)^m cos(a+b x+c x^2)^n	34	0	0	0	0	34	4.65	7.4
4 Trig functions\2a Tangent\2.0 (a trg)^m (b tan)^n	352	0	0	0	0	352	6.40	55.5
4 Trig functions\2a Tangent\2.1.2 (d sec)^m (a+b tan)^n	700	0	0	0	0	700	3.99	176.8
4 Trig functions\2a Tangent\2.1.3 (d sin)^m (a+b tan)^n	93	0	0	0	0	93	1.67	56.8
4 Trig functions\2a Tangent\2.2.1 (a+b tan)^m (c+d tan)^n	1342	0	0	0	0	1342	1.52	890.2
4 Trig functions\2a Tangent\2.3.1 (a+b tan)^m (c+d tan)^n (A+B tan)	859	0	0	0	0	859	1.35	641.8
4 Trig functions\2a Tangent\2.4.2 (a+b tan)^m (c+d tan)^n (A+B tan+C tan^2)	133	0	0	0	0	133	0.19	716.3
4 Trig functions\2a Tangent\2.9 trig^m (a+b tan^n+c tan^(2 n))^p	209	0	0	0	0	209	0.58	368.5
4 Trig functions\2a Tangent\2.10 (c+d x)^m (a+b tan)^n	62	0	1	0	0	63	2.40	26.4
4 Trig functions\2a Tangent\2.11 (e x)^m (a+b tan(c+d x^n))^p	72	0	0	0	0	72	1.79	40.7
4 Trig functions\2b Cotangent\2.0 (a trg)^m (b cot)^n	52	0	0	0	0	52	6.56	8.0
4 Trig functions\2b Cotangent\2.1.2 (d csc)^m (a+b cot)^n	23	0	0	0	0	23	9.39	2.5
4 Trig functions\2b Cotangent\2.1.3 (d cos)^m (a+b cot)^n	19	0	0	0	0	19	6.51	2.9
4 Trig functions\2b Cotangent\2.2.1 (a+b cot)^m (c+d cot)^n	106	0	0	0	0	106	1.34	79.8
4 Trig functions\2b Cotangent\2.9 trig^m (a+b cot^n+c cot^(2 n))^p	94	0	0	0	0	94	0.45	209.9
4 Trig functions\2b Cotangent\2.10 (c+d x)^m (a+b cot)^n	61	0	0	0	0	61	2.38	25.8
4 Trig functions\3a Secant\3.0 (a sec)^m (b trg)^n	283	0	0	0	0	283	11.40	24.9
4 Trig functions\3a Secant\3.1.2 (d sec)^n (a+b sec)^m	885	0	0	0	0	885	2.54	349.8
4 Trig functions\3a Secant\3.1.3 (d sin)^n (a+b sec)^m	306	0	0	0	0	306	1.79	172.6
4 Trig functions\3a Secant\3.1.4 (d tan)^n (a+b sec)^m	348	2	1	0	0	351	2.99	122.4
4 Trig functions\3a Secant\3.2.1 (a+b sec)^m (c+d sec)^n	243	0	0	0	0	243	1.81	135.1
4 Trig functions\3a Secant\3.2.3 (g sec)^p (a+b sec)^m (c+d sec)^n	286	0	0	0	0	286	2.66	108.5
4 Trig functions\3a Secant\3.3.1 (a+b sec)^m (d sec)^n (A+B sec)	645	0	0	0	0	645	1.09	593.2
4 Trig functions\3a Secant\3.4.1 (a+b sec)^m (A+B sec+C sec^2)	70	0	0	0	0	70	11.20	6.4
4 Trig functions\3a Secant\3.4.2 (a+b sec)^m (d sec)^n (A+B sec+C sec^2)	1373	0	0	0	0	1373	1.14	1205.6

4 Trig functions\3a Secant\3.7 trig^m (a+b sec^n+c sec^(2 n))^p	34	0	0	0	0	34	6.94	4.9
4 Trig functions\3a Secant\3.10 (c+d x)^m (a+b sec)^n	46	0	0	0	0	46	2.11	21.9
4 Trig functions\3a Secant\3.11 (e x)^m (a+b sec(c+d x^n))^p	83	0	0	0	0	83	1.35	61.9
4 Trig functions\3b Cosecant\3.0 (a csc)^m (b trg)^n	70	0	0	0	0	70	25.10	2.9
4 Trig functions\3b Cosecant\3.1.2 (d csc)^n (a+b csc)^m	59	0	0	0	0	59	4.36	13.7
4 Trig functions\3b Cosecant\3.1.3 (d cos)^n (a+b csc)^m	16	0	0	0	0	16	6.14	2.7
4 Trig functions\3b Cosecant\3.1.4 (d cot)^n (a+b csc)^m	23	0	0	0	0	23	5.71	4.1
4 Trig functions\3b Cosecant\3.3.1 (a+b csc)^m (d csc)^n (A+B csc)	24	0	0	0	0	24	10.80	2.3
4 Trig functions\3b Cosecant\3.4.2 (a+b csc)^m (d csc)^n (A+B csc+C csc^2)	1	0	0	0	0	1	4.27	0.3
4 Trig functions\3b Cosecant\3.7 trig^m (a+b csc^n+c csc^(2 n))^p	27	0	0	0	0	27	6.23	4.4
4 Trig functions\3b Cosecant\3.11 (e x)^m (a+b csc(c+d x^n))^p	84	0	0	0	0	84	1.36	62.1
4 Trig functions\4 Miscellaneous\4.1 (c trig)^m (d trig)^n	250	0	0	0	0	250	10.60	23.7
4 Trig functions\4 Miscellaneous\4.2 trig^m (a trig+b trig)^n	288	6	0	0	0	294	3.09	99.1
4 Trig functions\4 Miscellaneous\4.3 (c+d x)^m trig^n trig^p	397	0	0	0	0	397	1.77	226.7
4 Trig functions\4 Miscellaneous\4.4 x^m (a+b trig^n)^p	9	0	0	0	0	9	1.51	6.1
4 Trig functions\4 Miscellaneous\4.5 x^m trig(a+b log(c x^n))^p	268	0	0	0	0	268	9.69	28.2
4 Trig functions\4 Miscellaneous\4.6 f^(a+b x+c x^2) trig(d+e x+f x^2)^n	132	0	0	0	0	132	2.77	48.2
4 Trig functions\4 Miscellaneous\4.7 Trig functions	872	4	5	0	0	881	5.07	176.3
5 Inverse trig functions\1a Inverse sine\1.2 (d x)^m (a+b arcsin(c x))^n	227	0	0	0	0	227	4.60	49.7
5 Inverse trig functions\1a Inverse sine\1.4a (f x)^m (d-c^2 d x^2)^p (a+b arcsin(c x))^n	502	0	0	0	0	502	2.36	213.4
5 Inverse trig functions\1a Inverse sine\1.4b (f x)^m (d+e x^2)^p (a+b arcsin(c x))^n	109	0	0	0	0	109	1.15	95.2
5 Inverse trig functions\1a Inverse sine\1.5 Inverse sine functions	494	0	1	0	0	495	1.34	372.8
5 Inverse trig functions\1b Inverse cosine\1.2 (d x)^m (a+b arccos(c x))^n	227	0	0	0	0	227	4.60	49.7
5 Inverse Trig functions\1b Inverse cosine\1.5 Inverse cosine functions	136	0	0	0	0	136	2.92	46.8
5 Inverse trig functions\2a Inverse tangent\2.1.1 (d x)^m (a+b arctan(c x))^n	57	0	0	0	0	57	7.04	8.2
5 Inverse trig functions\2a Inverse tangent\2.1.2 (f x)^m (d-c^2 d x^2)^p (a+b arctan(c x))^n	993	0	1	0	0	994	2.06	482.9
5 Inverse trig functions\2a Inverse tangent\2.1.3 (f x)^m (d+e x^2)^p (a+b arctan(c x))^n	131	1	0	0	0	132	1.67	80.0
5 Inverse trig functions\2a Inverse tangent\2.1.4 Inverse tangent functions	217	0	0	0	0	217	4.18	52.6
5 Inverse trig functions\2a Inverse tangent\2.2.1 x^m (c+a^2 c x^2)^p E^(n arctan(a x))	142	0	0	0	0	142	7.36	19.4
5 Inverse trig functions\2a Inverse tangent\2.2.2 Exponentials of inverse tangent	242	0	0	0	0	242	3.06	79.8
5 Inverse trig functions\2b Inverse cotangent\2.1 Inverse cotangent functions	228	0	0	0	0	228	2.65	86.9
5 Inverse trig functions\2b Inverse cotangent\2.2 Exponentials of inverse cotangent	12	0	0	0	0	12	6.01	2.0
5 Inverse trig functions\3a Inverse secant\3.1 Inverse secant functions	166	0	0	0	0	166	2.07	80.8
5 Inverse trig functions\3b Inverse cosecant\3.1 Inverse cosecant functions	87	0	0	0	0	87	7.57	11.7
6 Hyperbolic functions\1a Hyperbolic sine\1.1 (c+d x)^m (a+b sinh)^n	186	0	0	0	0	186	2.72	69.1
6 Hyperbolic functions\1a Hyperbolic sine\1.3 (e x)^m (a+b sinh(c+d x^n))^p	96	0	0	0	0	96	5.64	17.3
6 Hyperbolic functions\1a Hyperbolic sine\1.4 (d+e x)^m sinh(a+b x+c x^2)^n	33	0	0	0	0	33	5.58	6.0
6 Hyperbolic functions\1a Hyperbolic sine\1.5 Hyperbolic sine functions	694	0	0	0	0	694	3.42	205.2
6 Hyperbolic functions\1b Hyperbolic cosine\1.1 (c+d x)^m (a+b cosh)^n	183	0	0	0	0	183	3.32	55.8
6 Hyperbolic functions\1b Hyperbolic cosine\1.2 (e x)^m (a+b x^n)^p cosh	113	0	0	0	0	113	0.79	143.4
6 Hyperbolic functions\1b Hyperbolic cosine\1.3 (e x)^m (a+b cosh(c+d x^n))^p	62	0	0	0	0	62	5.47	11.6
6 Hyperbolic functions\1b Hyperbolic cosine\1.4 (d+e x)^m cosh(a+b x+c x^2)^n	33	0	0	0	0	33	5.54	6.0
6 Hyperbolic functions\1b Hyperbolic cosine\1.5 Hyperbolic cosine functions	407	0	0	0	0	407	4.64	89.3
6 Hyperbolic functions\2a Hyperbolic tangent\2.1 (c+d x)^m (a+b tanh)^n	79	0	0	0	0	79	2.75	28.9
6 Hyperbolic functions\2a Hyperbolic tangent\2.2 Hyperbolic tangent functions	461	0	0	0	0	461	3.61	128.7
6 Hyperbolic functions\2b Hyperbolic cotangent\2.1 (c+d x)^m (a+b coth)^n	61	0	0	0	0	61	2.31	26.6
6 Hyperbolic functions\2b Hyperbolic cotangent\2.2 Hyperbolic cotangent functions	228	0	0	0	0	228	6.24	36.9
6 Hyperbolic functions\3a Hyperbolic secant\3.1 (c+d x)^m (a+b sech)^n	16	0	0	0	0	16	7.33	2.2
6 Hyperbolic functions\3a Hyperbolic secant\3.2 (e x)^m (a+b sech(c+d x^n))^p	84	0	0	0	0	84	1.47	57.5
6 Hyperbolic functions\3a Hyperbolic secant\3.3 Hyperbolic secant functions	394	0	0	0	0	394	4.77	83.5
6 Hyperbolic functions\3b Hyperbolic cosecant\3.1 (c+d x)^m (a+b csch)^n	16	0	0	0	0	16	6.22	2.6
6 Hyperbolic functions\3b Hyperbolic cosecant\3.2 (e x)^m (a+b csch(c+d x^n))^p	83	0	0	0	0	83	1.53	54.6

6 Hyperbolic functions\3b Hyperbolic cosecant\3.3 Hyperbolic cosecant functions	195	0	0	0	0	195	6.99	28.3
6 Hyperbolic functions\4 Miscellaneous\4.1 Hyperbolic functions	1055	0	0	0	0	1055	4.38	243.3
7 Inverse hyperbolic functions\1a Inverse hyperbolic sine\1.2 (d x)^m (a+b arcsinh(c x))^n	156	0	0	0	0	156	3.60	43.6
7 Inverse hyperbolic functions\1a Inverse hyperbolic sine\1.4a (f x)^m (d+c^2 d x^2)^p (a+b arcsinh(c x))^n	469	0	0	0	0	469	2.37	198.8
7 Inverse hyperbolic functions\1a Inverse hyperbolic sine\1.4b (f x)^m (d+e x^2)^p (a+b arcsinh(c x))^n	58	0	0	0	0	58	1.95	30.0
7 Inverse hyperbolic functions\1a Inverse hyperbolic sine\1.5 Inverse hyperbolic sine functions	370	0	1	0	0	371	2.13	175.5
7 Inverse hyperbolic functions\1b Inverse hyperbolic cosine\1.2 (d x)^m (a+b arccosh(c x))^n	166	0	0	0	0	166	2.71	61.4
7 Inverse hyperbolic functions\1b Inverse hyperbolic cosine\1.4a (f x)^m (d-c^2 d x^2)^p (a+b arccosh(c x))^n	453	0	0	0	0	453	1.61	282.2
7 Inverse hyperbolic functions\1b Inverse hyperbolic cosine\1.4b (f x)^m (d+e x^2)^p (a+b arccosh(c x))^n	109	0	0	0	0	109	1.00	109.4
7 Inverse hyperbolic functions\1b Inverse hyperbolic cosine\1.5 Inverse hyperbolic cosine functions	293	0	0	0	0	293	1.69	173.9
7 Inverse hyperbolic functions\2a Inverse hyperbolic tangent\2.1 Inverse hyperbolic tangent functions	799	0	1	0	0	800	4.10	196.5
7 Inverse hyperbolic functions\2a Inverse hyperbolic tangent\2.2.1 x^m (c-a^2 c x^2)^p E^(n arctanh(a x))	496	0	0	0	0	496	4.56	109.3
7 Inverse hyperbolic functions\2a Inverse hyperbolic tangent\2.2.2 Exponentials of inverse hyperbolic tangent functions	881	0	0	0	0	881	3.89	227.5
7 Inverse hyperbolic functions\2b Inverse hyperbolic cotangent\2.1 Inverse hyperbolic cotangent functions	252	0	1	0	0	253	3.64	70.2
7 Inverse hyperbolic functions\2b Inverse hyperbolic cotangent\2.2 Exponentials of inverse hyperbolic cotangent functions	935	0	0	0	0	935	3.46	271.8
7 Inverse hyperbolic functions\3a Inverse hyperbolic secant\3.1 Inverse hyperbolic secant functions	119	0	1	0	0	120	3.46	35.1
7 Inverse hyperbolic functions\3b Inverse hyperbolic cosecant\3.1 Inverse hyperbolic cosecant functions	63	0	0	0	0	63	7.44	8.5
8 Special functions\8.1 Error functions	115	0	0	0	0	115	4.98	23.4
8 Special functions\8.2 Fresnel integral functions	126	0	0	0	0	126	5.05	25.3
8 Special functions\8.3 Exponential integral functions	149	0	0	0	0	149	5.70	26.6
8 Special functions\8.4 Trig integral functions	122	0	0	0	0	122	2.77	44.4
8 Special functions\8.5 Hyperbolic integral functions	122	0	0	0	0	122	2.81	44.0
8 Special functions\8.6 Gamma functions	168	0	0	0	0	168	8.20	20.8
8 Special functions\8.7 Zeta function	14	0	0	0	0	14	23.00	0.6
8 Special functions\8.8 Polylogarithm function	27	0	0	0	0	27	5.44	5.0
8 Special functions\8.9 Product logarithm function	396	0	0	0	0	396	6.43	61.9
Totals	63523	71	53	0	1	63648	2.41	26840.0
Percentages	99.80%	0.11%	0.08%	0.00%	0.00%	100.00%		