# Mathematica 11.3 Integration Test Results

## Test results for the 4 problems in "4.2.2.2 (g sin)^p (a+b cos)^m (c+d cos)^n.m"

### Problem 1: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{d\,\text{Cos}[e+f\,x]}\ \sqrt{g\,\text{Sin}[e+f\,x]}}{a+b\,\text{Cos}[e+f\,x]}\,dx$$

Optimal (type 4, 509 leaves, 16 steps):

$$-\frac{\sqrt{d}\ \sqrt{g}\ \text{ArcTan}\left[1-\frac{\sqrt{2}\ \sqrt{d}\ \sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{g}\ \sqrt{d\,\text{Cos}[e+f\,x]}}\right]}{\sqrt{2}\ b\,f}+\frac{\sqrt{d}\ \sqrt{g}\ \text{ArcTan}\left[1+\frac{\sqrt{2}\ \sqrt{d}\ \sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{g}\ \sqrt{d\,\text{Cos}[e+f\,x]}}\right]}{\sqrt{2}\ b\,f}+$$

$$\frac{2\sqrt{2}\ a\,d\sqrt{g}\ \sqrt{\text{Cos}[e+f\,x]}\ \text{EllipticPi}\left[-\frac{\sqrt{-a+b}}{\sqrt{a+b}},\ \text{ArcSin}\left[\frac{\sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{g}\ \sqrt{1+\text{Cos}[e+f\,x]}}\right],\ -1\right]}{b\sqrt{-a+b}\ \sqrt{a+b}\ f\sqrt{d\,\text{Cos}[e+f\,x]}}-$$

$$\frac{2\sqrt{2}\ a\,d\sqrt{g}\ \sqrt{\text{Cos}[e+f\,x]}\ \text{EllipticPi}\left[\frac{\sqrt{-a+b}}{\sqrt{a+b}},\ \text{ArcSin}\left[\frac{\sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{g}\ \sqrt{1+\text{Cos}[e+f\,x]}}\right],\ -1\right]}{b\sqrt{-a+b}\ \sqrt{a+b}\ f\sqrt{d\,\text{Cos}[e+f\,x]}}+$$

$$\frac{\sqrt{d}\ \sqrt{g}\ \text{Log}\left[\sqrt{g}-\frac{\sqrt{2}\ \sqrt{d}\ \sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{d\,\text{Cos}[e+f\,x]}}+\sqrt{g}\ \text{Tan}[e+f\,x]\right]}{2\sqrt{2}\ b\,f}-$$

$$\frac{\sqrt{d}\ \sqrt{g}\ \text{Log}\left[\sqrt{g}+\frac{\sqrt{2}\ \sqrt{d}\ \sqrt{g\,\text{Sin}[e+f\,x]}}{\sqrt{d\,\text{Cos}[e+f\,x]}}+\sqrt{g}\ \text{Tan}[e+f\,x]\right]}{2\sqrt{2}\ b\,f}$$

Result (type 4, 272 leaves):

$$\frac{1}{\sqrt{-a-b}\,\sqrt{a-b}\,b\,f\,\sqrt{\frac{\text{Cos}[e+f x]}{1+\text{Cos}[e+f x]}}\,\sqrt{g\,\text{Sin}[e+f x]}}$$

$$2\sqrt{2}\,g\,\sqrt{d\,\text{Cos}[e+f x]}\left(-i\sqrt{-a-b}\,\sqrt{a-b}\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{1}{2}(e+f x)\right]}\right],-1\right]+\right.$$

$$i\sqrt{-a-b}\,\sqrt{a-b}\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{1}{2}(e+f x)\right]}\right],-1\right]+$$

$$a\left(\text{EllipticPi}\left[-\frac{\sqrt{a-b}}{\sqrt{-a-b}},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{1}{2}(e+f x)\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[\frac{\sqrt{a-b}}{\sqrt{-a-b}},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{1}{2}(e+f x)\right]}\right],-1\right]\right)\right)\sqrt{\text{Tan}\left[\frac{1}{2}(e+f x)\right]}$$

## Problem 2: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{d\,\text{Cos}[e+f x]}}{(a+b\,\text{Cos}[e+f x])\,\sqrt{g\,\text{Sin}[e+f x]}}\,dx$$

Optimal (type 4, 209 leaves, 4 steps):

$$\frac{2\sqrt{2}\,\sqrt{d}\,\text{EllipticPi}\left[-\frac{a}{b-\sqrt{-a^2+b^2}},\text{ArcSin}\left[\frac{\sqrt{d\,\text{Cos}[e+f x]}}{\sqrt{d}\,\sqrt{1+\text{Sin}[e+f x]}}\right],-1\right]\sqrt{\text{Sin}[e+f x]}}{\sqrt{-a^2+b^2}\,f\,\sqrt{g\,\text{Sin}[e+f x]}}-$$

$$\frac{2\sqrt{2}\,\sqrt{d}\,\text{EllipticPi}\left[-\frac{a}{b+\sqrt{-a^2+b^2}},\text{ArcSin}\left[\frac{\sqrt{d\,\text{Cos}[e+f x]}}{\sqrt{d}\,\sqrt{1+\text{Sin}[e+f x]}}\right],-1\right]\sqrt{\text{Sin}[e+f x]}}{\sqrt{-a^2+b^2}\,f\,\sqrt{g\,\text{Sin}[e+f x]}}$$

Result (type 6, 594 leaves):

$$\frac{1}{f\,(a+b\,\mathrm{Cos}[e+f\,x])\,\sqrt{g\,\mathrm{Sin}[e+f\,x]}\,\left(1+\mathrm{Tan}[e+f\,x]^2\right)^{3/2}}$$
$$2\,\sqrt{d\,\mathrm{Cos}[e+f\,x]}\,\mathrm{Sec}[e+f\,x]^2\,\sqrt{\mathrm{Tan}[e+f\,x]}\,\left(b+a\,\sqrt{1+\mathrm{Tan}[e+f\,x]^2}\right)\left(\frac{1}{4\,\sqrt{2}\,\left(a^2-b^2\right)^{3/4}}\right.$$
$$\sqrt{a}\,\left(-2\,\mathrm{ArcTan}\left[1-\frac{\sqrt{2}\,\sqrt{a}\,\sqrt{\mathrm{Tan}[e+f\,x]}}{\left(a^2-b^2\right)^{1/4}}\right]+2\,\mathrm{ArcTan}\left[1+\frac{\sqrt{2}\,\sqrt{a}\,\sqrt{\mathrm{Tan}[e+f\,x]}}{\left(a^2-b^2\right)^{1/4}}\right]-\right.$$
$$\mathrm{Log}\left[\sqrt{a^2-b^2}-\sqrt{2}\,\sqrt{a}\,\left(a^2-b^2\right)^{1/4}\sqrt{\mathrm{Tan}[e+f\,x]}+a\,\mathrm{Tan}[e+f\,x]\right]+$$
$$\left.\mathrm{Log}\left[\sqrt{a^2-b^2}+\sqrt{2}\,\sqrt{a}\,\left(a^2-b^2\right)^{1/4}\sqrt{\mathrm{Tan}[e+f\,x]}+a\,\mathrm{Tan}[e+f\,x]\right]\right)+$$
$$\left(5\,b\,\left(a^2-b^2\right)\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},-\mathrm{Tan}[e+f\,x]^2,-\frac{a^2\,\mathrm{Tan}[e+f\,x]^2}{a^2-b^2}\right]\sqrt{\mathrm{Tan}[e+f\,x]}\right)\Big/$$
$$\left(\sqrt{1+\mathrm{Tan}[e+f\,x]^2}\,\left(-5\,\left(a^2-b^2\right)\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},-\mathrm{Tan}[e+f\,x]^2,-\frac{a^2\,\mathrm{Tan}[e+f\,x]^2}{a^2-b^2}\right]+\right.\right.$$
$$2\,\left(2\,a^2\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},-\mathrm{Tan}[e+f\,x]^2,-\frac{a^2\,\mathrm{Tan}[e+f\,x]^2}{a^2-b^2}\right]+\right.$$
$$\left.\left(a^2-b^2\right)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},-\mathrm{Tan}[e+f\,x]^2,-\frac{a^2\,\mathrm{Tan}[e+f\,x]^2}{a^2-b^2}\right]\right)$$
$$\left.\left.\left.\mathrm{Tan}[e+f\,x]^2\right)\,\left(-b^2+a^2\,\left(1+\mathrm{Tan}[e+f\,x]^2\right)\right)\right)\right)$$

## Problem 3: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{g\,\mathrm{Sin}[e+f\,x]}}{\sqrt{d\,\mathrm{Cos}[e+f\,x]}\,(a+b\,\mathrm{Cos}[e+f\,x])}\,dx$$

Optimal (type 4, 208 leaves, 5 steps):

$$-\left(\left(2\,\sqrt{2}\,\sqrt{g}\,\sqrt{\mathrm{Cos}[e+f\,x]}\,\mathrm{EllipticPi}\left[-\frac{\sqrt{-a+b}}{\sqrt{a+b}},\mathrm{ArcSin}\left[\frac{\sqrt{g\,\mathrm{Sin}[e+f\,x]}}{\sqrt{g}\,\sqrt{1+\mathrm{Cos}[e+f\,x]}}\right],-1\right]\right)\Big/\right.$$
$$\left.\left(\sqrt{-a+b}\,\sqrt{a+b}\,f\,\sqrt{d\,\mathrm{Cos}[e+f\,x]}\right)\right)+$$
$$\left(2\,\sqrt{2}\,\sqrt{g}\,\sqrt{\mathrm{Cos}[e+f\,x]}\,\mathrm{EllipticPi}\left[\frac{\sqrt{-a+b}}{\sqrt{a+b}},\mathrm{ArcSin}\left[\frac{\sqrt{g\,\mathrm{Sin}[e+f\,x]}}{\sqrt{g}\,\sqrt{1+\mathrm{Cos}[e+f\,x]}}\right],-1\right]\right)\Big/$$
$$\left(\sqrt{-a+b}\,\sqrt{a+b}\,f\,\sqrt{d\,\mathrm{Cos}[e+f\,x]}\right)$$

Result (type 6, 596 leaves):

$$\left(2\,\mathrm{Sec}[e+fx]^2\sqrt{g\,\mathrm{Sin}[e+fx]}\left(b+a\sqrt{1+\mathrm{Tan}[e+fx]^2}\right)\left(\left(\left(-2\,\mathrm{ArcTan}\left[1-\frac{\sqrt{2}\sqrt{a}\sqrt{\mathrm{Tan}[e+fx]}}{(a^2-b^2)^{1/4}}\right]+2\,\mathrm{ArcTan}\left[1+\frac{\sqrt{2}\sqrt{a}\sqrt{\mathrm{Tan}[e+fx]}}{(a^2-b^2)^{1/4}}\right]+\mathrm{Log}\left[\sqrt{a^2-b^2}-\sqrt{2}\sqrt{a}\,(a^2-b^2)^{1/4}\sqrt{\mathrm{Tan}[e+fx]}+a\,\mathrm{Tan}[e+fx]\right]-\mathrm{Log}\left[\sqrt{a^2-b^2}+\sqrt{2}\sqrt{a}\,(a^2-b^2)^{1/4}\sqrt{\mathrm{Tan}[e+fx]}+a\,\mathrm{Tan}[e+fx]\right]\right)\Big/\left(4\sqrt{2}\sqrt{a}\,(a^2-b^2)^{1/4}\right)+\left(7\,b\,(a^2-b^2)\,\mathrm{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},-\mathrm{Tan}[e+fx]^2,-\frac{a^2\,\mathrm{Tan}[e+fx]^2}{a^2-b^2}\right]\mathrm{Tan}[e+fx]^{3/2}\right)\Big/\left(3\sqrt{1+\mathrm{Tan}[e+fx]^2}\left(-7\,(a^2-b^2)\,\mathrm{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},-\mathrm{Tan}[e+fx]^2,-\frac{a^2\,\mathrm{Tan}[e+fx]^2}{a^2-b^2}\right]+2\left(2\,a^2\,\mathrm{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},-\mathrm{Tan}[e+fx]^2,-\frac{a^2\,\mathrm{Tan}[e+fx]^2}{a^2-b^2}\right]+(a^2-b^2)\,\mathrm{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},-\mathrm{Tan}[e+fx]^2,-\frac{a^2\,\mathrm{Tan}[e+fx]^2}{a^2-b^2}\right]\right)\mathrm{Tan}[e+fx]^2\right)\left(-b^2+a^2\,(1+\mathrm{Tan}[e+fx]^2)\right)\right)\right)\right)\Big/\left(f\sqrt{d\,\mathrm{Cos}[e+fx]}\,(a+b\,\mathrm{Cos}[e+fx])\sqrt{\mathrm{Tan}[e+fx]}\,(1+\mathrm{Tan}[e+fx]^2)^{3/2}\right)$$

## Problem 4: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{d\,\mathrm{Cos}[e+fx]}\,(a+b\,\mathrm{Cos}[e+fx])\sqrt{g\,\mathrm{Sin}[e+fx]}}\,dx$$

Optimal (type 4, 273 leaves, 7 steps):

$$-\left(\left(2\sqrt{2}\,b\,\mathrm{EllipticPi}\left[-\frac{a}{b-\sqrt{-a^2+b^2}},\mathrm{ArcSin}\left[\frac{\sqrt{d\,\mathrm{Cos}[e+fx]}}{\sqrt{d}\sqrt{1+\mathrm{Sin}[e+fx]}}\right],-1\right]\sqrt{\mathrm{Sin}[e+fx]}\right)\Big/\left(a\sqrt{-a^2+b^2}\sqrt{d}\,f\sqrt{g\,\mathrm{Sin}[e+fx]}\right)\right)+\left(2\sqrt{2}\,b\,\mathrm{EllipticPi}\left[-\frac{a}{b+\sqrt{-a^2+b^2}},\mathrm{ArcSin}\left[\frac{\sqrt{d\,\mathrm{Cos}[e+fx]}}{\sqrt{d}\sqrt{1+\mathrm{Sin}[e+fx]}}\right],-1\right]\sqrt{\mathrm{Sin}[e+fx]}\right)\Big/\left(a\sqrt{-a^2+b^2}\sqrt{d}\,f\sqrt{g\,\mathrm{Sin}[e+fx]}\right)+\frac{\mathrm{EllipticF}\left[e-\frac{\pi}{4}+fx,2\right]\sqrt{\mathrm{Sin}[2e+2fx]}}{a\,f\sqrt{d\,\mathrm{Cos}[e+fx]}\sqrt{g\,\mathrm{Sin}[e+fx]}}$$

Result (type 6, 5869 leaves):

$$\Bigg(4\,(a+b)\,\mathrm{Cos}\left[\frac{1}{2}(e+f x)\right]^3 \mathrm{Sin}\left[\frac{1}{2}(e+f x)\right]$$

$$\Bigg(\Bigg(25\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg)\Big/$$

$$\Bigg(5\,(a+b)\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+$$

$$2\Bigg(-2\,(a-b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+$$

$$(a+b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg)$$

$$\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)+\Bigg(9\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)\Big/$$

$$\Bigg(9\,(a+b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+$$

$$2\Bigg(-2\,(a-b)\,\mathrm{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+$$

$$(a+b)\,\mathrm{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg)\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)\Bigg)\Bigg)\Big/$$

$$\Bigg(5\,f\,\sqrt{\mathrm{Cos}[e+f x]}\,\sqrt{d\,\mathrm{Cos}[e+f x]}\,(a+b\,\mathrm{Cos}[e+f x])^2\sqrt{\mathrm{Sin}[e+f x]}$$

$$\sqrt{g\,\mathrm{Sin}[e+f x]}$$

$$\Bigg(-\frac{1}{5\,(a+b\,\mathrm{Cos}[e+f x])\,\mathrm{Sin}[e+f x]^{3/2}}$$

$$2\,(a+b)\,\mathrm{Cos}\left[\frac{1}{2}(e+f x)\right]^3\sqrt{\mathrm{Cos}[e+f x]}\,\mathrm{Sin}\left[\frac{1}{2}(e+f x)\right]$$

$$\Bigg(\Bigg(25\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg)\Big/$$

$$\left(5\,(a+b)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)+$$

$$\left(9\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\Big/\left(9\,(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\right)+$$

$$\frac{1}{5\sqrt{\text{Cos}[e+f x]}\,(a+b\,\text{Cos}[e+f x])\,\sqrt{\text{Sin}[e+f x]}}\,2\,(a+b)\,\text{Cos}\left[\frac{1}{2}(e+f x)\right]^4$$

$$\left(\left(25\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\Big/\left(5\,(a+b)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)+\left(9\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.\right.$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2\Bigg)\Big/$$

$$\Bigg(9\,(a+b)\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,1,\,\frac{9}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]+$$

$$2\,\Bigg(-2\,(a-b)\,\text{AppellF1}\Big[\frac{9}{4},\,\frac{1}{2},\,2,\,\frac{13}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]+(a+b)\,\text{AppellF1}\Big[\frac{9}{4},\,\frac{3}{2},\,1,\,\frac{13}{4},$$

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

$$\frac{1}{5\,\sqrt{\text{Cos}[e+f\,x]}\,\left(a+b\,\text{Cos}[e+f\,x]\right)\,\sqrt{\text{Sin}[e+f\,x]}}\,6\,(a+b)\,\text{Cos}\left[\frac{1}{2}\,(e+f\,x)\right]^2$$

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

$$\Bigg(\Bigg(25\,\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,1,\,\frac{5}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]\Bigg)\Big/$$

$$\Bigg(5\,(a+b)\,\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,1,\,\frac{5}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]+$$

$$2\,\Bigg(-2\,(a-b)\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,2,\,\frac{9}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]+$$

$$(a+b)\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{3}{2},\,1,\,\frac{9}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2\Bigg)+\Bigg(9\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,1,\,\frac{9}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2\Bigg)\Big/$$

$$\Bigg(9\,(a+b)\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,1,\,\frac{9}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,\,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2}{a+b}\Big]+$$

$$2\,\Bigg(-2\,(a-b)\,\text{AppellF1}\Big[\frac{9}{4},\,\frac{1}{2},\,2,\,\frac{13}{4},\,\text{Tan}\left[\frac{1}{2}\,(e+f\,x)\right]^2,$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big] + (a+b)\,\text{AppellF1}\Big[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},$$

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

$$\frac{1}{5\sqrt{\text{Cos}[e+f x]}\,(a+b\,\text{Cos}[e+f x])^2}\,4\,b\,(a+b)\,\text{Cos}\left[\frac{1}{2}(e+f x)\right]^3$$

$$\text{Sin}\left[\frac{1}{2}(e+f x)\right]\sqrt{\text{Sin}[e+f x]}$$

$$\Bigg(\Bigg(25\,\text{AppellF1}\Big[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big]\Bigg)\Big/$$

$$\Bigg(5\,(a+b)\,\text{AppellF1}\Big[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big] +$$

$$2\Bigg(-2\,(a-b)\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big] +$$

$$(a+b)\,\text{AppellF1}\Big[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg) + \Bigg(9\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big]\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)\Big/$$

$$\Bigg(9\,(a+b)\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big] +$$

$$2\Bigg(-2\,(a-b)\,\text{AppellF1}\Big[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Big] + (a+b)\,\text{AppellF1}\Big[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},$$

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

$$\frac{1}{5\,\text{Cos}[e+f x]^{3/2}\,(a+b\,\text{Cos}[e+f x])}\,2\,(a+b)\,\text{Cos}\left[\frac{1}{2}(e+f x)\right]^3\,\text{Sin}\left[\frac{1}{2}(e+f x)\right]$$

$$\sqrt{\text{Sin}[e+f x]}$$

$$\left(\left(25\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\Big/\right.$$

$$\left(5\,(a+b)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+\right.$$

$$2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+\right.$$

$$\left.(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)+\left(9\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.\right.$$

$$\left.\left.-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\Big/$$

$$\left(9\,(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+\right.$$

$$2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.\right.$$

$$-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\Bigg]+(a+b)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\right.$$

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

$$\frac{1}{5\sqrt{\text{Cos}[e+f x]}\,(a+b\,\text{Cos}[e+f x])\,\sqrt{\text{Sin}[e+f x]}}\,4\,(a+b)\,\text{Cos}\left[\frac{1}{2}(e+f x)\right]^3$$

$$\text{Sin}\left[\frac{1}{2}(e+f x)\right]$$

$$\left(\left(25\left(-\frac{1}{5\,(a+b)}(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.\right.\right.\right.$$

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

$$\frac{1}{10}\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]$$

$$\mathrm{Sec}\left[\frac{1}{2}(e+fx)\right]^2\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(5(a+b)\,\mathrm{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+$$

$$2\Bigg(-2(a-b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+$$

$$(a+b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\Bigg)$$

$$\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)+\Bigg(9\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\mathrm{Sec}\left[\frac{1}{2}(e+fx)\right]^2\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]\Bigg)\Bigg/$$

$$\Bigg(9(a+b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+$$

$$2\Bigg(-2(a-b)\,\mathrm{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+(a+b)\,\mathrm{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\right.$$

$$\left.\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\Bigg)\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)+$$

$$\Bigg(9\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg(-\frac{1}{9(a+b)}5(a-b)\,\mathrm{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\right.$$

$$\left.\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\mathrm{Sec}\left[\frac{1}{2}(e+fx)\right]^2$$

$$\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]+\frac{5}{18}\mathrm{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\mathrm{Sec}\left[\frac{1}{2}(e+fx)\right]^2\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(9(a+b)\,\mathrm{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\mathrm{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+$$

$$2\left(-2\,(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)-$$

$$\Bigg(25\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg(2\Bigg(-2\,(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\Bigg)$$

$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]+5\,(a+b)\Bigg(-\frac{1}{5\,(a+b)}(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{1}{10}\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+$$

$$2\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg(-2\,(a-b)\Bigg(-\frac{1}{9\,(a+b)}10\,(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},3,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{5}{18}\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+$$

$$(a+b)\Bigg(-\frac{1}{9\,(a+b)}5\,(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]+$$

$$\frac{5}{6}\text{AppellF1}\left[\frac{9}{4},\frac{5}{2},1,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]$$

$$\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\text{Tan}\left[\frac{1}{2}(e+fx)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(5(a+b)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+$$

$$2\Bigg(-2(a-b)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)^2-$$

$$\Bigg(9\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]$$

$$\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg(2\Bigg(-2(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]+(a+b)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\Bigg)\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\text{Tan}\Big[$$

$$\frac{1}{2}(e+fx)\Big]+9(a+b)\Bigg(-\frac{1}{9(a+b)}5(a-b)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2$$

$$\text{Tan}\left[\frac{1}{2}(e+fx)\right]+\frac{5}{18}\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\text{Tan}\left[\frac{1}{2}(e+fx)\right]\Bigg)+$$

$$2\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg(-2(a-b)\Bigg(-\frac{1}{13(a+b)}18(a-b)\,\text{AppellF1}\left[\frac{13}{4},\frac{1}{2},3,\right.$$

$$\left.\frac{17}{4},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\frac{(a-b)\,\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2$$

$$\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]+\frac{9}{26}\,\text{AppellF1}\left[\frac{13}{4},\frac{3}{2},2,\frac{17}{4},\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2,\right.$$

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

$$\left(a+b\right)\left(-\frac{1}{13\left(a+b\right)}9\left(a-b\right)\text{AppellF1}\left[\frac{13}{4},\frac{3}{2},2,\frac{17}{4},\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2,\right.\right.$$

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

$$\frac{27}{26}\,\text{AppellF1}\left[\frac{13}{4},\frac{5}{2},1,\frac{17}{4},\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2,\right.$$

$$\left.\left.\left.\left.\left.-\frac{\left(a-b\right)\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2}{a+b}\right]\text{Sec}\left[\frac{1}{2}\left(e+f x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]\right)\right)\right)\right)\Big/$$

$$\left(9\left(a+b\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2,-\frac{\left(a-b\right)\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2}{a+b}\right]+\right.$$

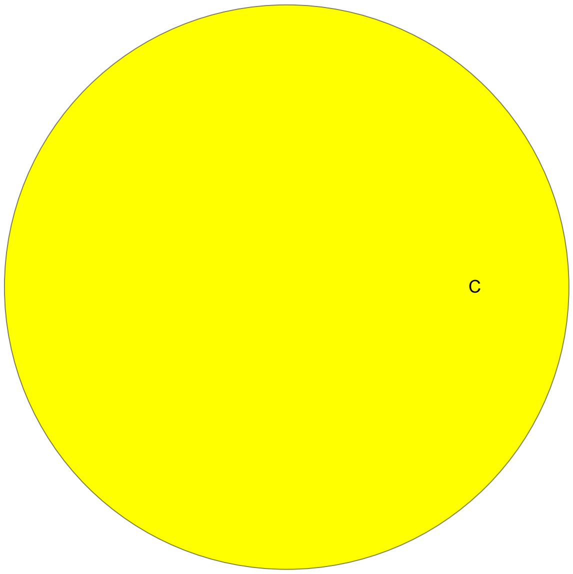
$$2\left(-2\left(a-b\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2,\right.\right.$$

$$\left.-\frac{\left(a-b\right)\text{Tan}\left[\frac{1}{2}\left(e+f x\right)\right]^2}{a+b}\right]+\left(a+b\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\right.$$

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

# Summary of Integration Test Results

4 integration problems




A - 0 optimal antiderivatives

B - 0 more than twice size of optimal antiderivatives

C - 4 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts