

$$\int \frac{dx}{\sqrt{x} \left(1 + \sqrt[3]{x}\right)}$$

$$\begin{aligned} \int \frac{dx}{\sqrt{x}(1+x^{1/3})} &= [x=t^6] = \int \frac{6t^5 dt}{t^3(1+t^2)} = \\ &= \int \frac{6t^2 dt}{1+t^2} = 6 \int \frac{t^2 dt}{1+t^2} = \\ &= 6 \int \frac{(t^2+1-1) dt}{1+t^2} = 6 \int \left(\frac{t^2+1}{1+t^2} - \frac{1}{1+t^2} \right) dt = \\ &= 6 \int 1 dt - 6 \int \frac{1}{1+t^2} dt = 6t - 6 \arctg(t) + C = 6x^{1/6} - \\ &6 \arctg(x^{1/6}) + C \end{aligned}$$

$$(t^6)' = 6t^5$$

$$d(t^6)/dt = 6t^5 dt / dt = 6t^5$$

$$d(t^6) = 6t^5 dt$$

$$5dt = d(5x) = d(5x+6) = 5dt + 0dt = 5dt$$

$$\int \sin x \cos x dx = \int \sin x d(\sin x) =$$

$$= \int \sin x dt = -\frac{t^2}{2} + C =$$

$$= -(\sin x)^2/2 + C$$

$$(\sin x)' = \cos x$$

$$d(\sin x) = \cos x dx$$