

Answer on Question #49366 – Math – Trigonometry

Prove $\frac{\cos x - \sin x}{\cos x + \sin x} = \sec 2x - \tan 2x$

Solution.

$$\begin{aligned} \frac{\cos x - \sin x}{\cos x + \sin x} &= \frac{(\cos x - \sin x)^2}{(\cos x + \sin x)(\cos x - \sin x)} = \frac{\cos^2 x - 2 \sin x \cos x + \sin^2 x}{\cos^2 x - \sin^2 x} = \\ &= \frac{1 - 2 \sin x \cos x}{\cos 2x} = \frac{1 - \sin 2x}{\cos 2x} = \frac{1}{\cos 2x} - \tan 2x = \sec 2x - \tan 2x. \end{aligned}$$