

$$\left\{ \begin{aligned} \operatorname{Tg}(a+b) &= \frac{\operatorname{Tg} a + \operatorname{Tg} b}{1 - \operatorname{Tg} a \operatorname{Tg} b} & \operatorname{Tg}(a-b) &= \frac{\operatorname{Tg} a - \operatorname{Tg} b}{1 + \operatorname{Tg} a \operatorname{Tg} b} \end{aligned} \right.$$

$$14) \frac{\operatorname{Tg}\left(\frac{\pi}{4}+x\right) - \operatorname{Tg}\left(\frac{\pi}{4}-x\right)}{\operatorname{Tg}\left(\frac{\pi}{4}+x\right) + \operatorname{Tg}\left(\frac{\pi}{4}-x\right)} = 2 \sin x \cos x$$

We have :

$$\left\{ \begin{aligned} \operatorname{Tg}\left(\frac{\pi}{4}+x\right) &= \frac{\overset{=1}{\operatorname{Tg}\frac{\pi}{4}} + \operatorname{Tg} x}{1 - \operatorname{Tg}\frac{\pi}{4} \cdot \operatorname{Tg} x} = \frac{1 + \operatorname{Tg} x}{1 - \operatorname{Tg} x} \\ \operatorname{Tg}\left(\frac{\pi}{4}-x\right) &= \frac{\operatorname{Tg}\frac{\pi}{4} - \operatorname{Tg} x}{1 + \operatorname{Tg}\frac{\pi}{4} \cdot \operatorname{Tg} x} = \frac{1 - \operatorname{Tg} x}{1 + \operatorname{Tg} x} \end{aligned} \right.$$

then :

$$\begin{aligned} & \frac{\operatorname{Tg}\left(\frac{\pi}{4}+x\right) - \operatorname{Tg}\left(\frac{\pi}{4}-x\right)}{\operatorname{Tg}\left(\frac{\pi}{4}+x\right) + \operatorname{Tg}\left(\frac{\pi}{4}-x\right)} = \\ &= \frac{\frac{1 + \operatorname{Tg} x}{1 - \operatorname{Tg} x} - \frac{1 - \operatorname{Tg} x}{1 + \operatorname{Tg} x}}{\frac{1 + \operatorname{Tg} x}{1 - \operatorname{Tg} x} + \frac{1 - \operatorname{Tg} x}{1 + \operatorname{Tg} x}} = \frac{\frac{(1 + \operatorname{Tg} x)^2 - (1 - \operatorname{Tg} x)^2}{(1 - \operatorname{Tg} x)(1 + \operatorname{Tg} x)}}{\frac{(1 + \operatorname{Tg} x)^2 + (1 - \operatorname{Tg} x)^2}{(1 - \operatorname{Tg} x)(1 + \operatorname{Tg} x)}} \\ &= \frac{(1 + \operatorname{Tg} x)^2 - (1 - \operatorname{Tg} x)^2}{(1 + \operatorname{Tg} x)^2 + (1 - \operatorname{Tg} x)^2} \\ &= \frac{\cancel{1} + 2\operatorname{Tg} x + \cancel{\operatorname{Tg}^2 x} - (\cancel{1} - 2\operatorname{Tg} x + \cancel{\operatorname{Tg}^2 x})}{1 + 2\cancel{\operatorname{Tg} x} + \cancel{\operatorname{Tg}^2 x} + 1 - 2\cancel{\operatorname{Tg} x} + \cancel{\operatorname{Tg}^2 x}} \end{aligned}$$