

$$\begin{aligned}\frac{1}{1 + \operatorname{tg} x \operatorname{tg} \frac{x}{2}} &= \frac{1}{1 + \frac{\sin x}{\cos x} \cdot \frac{\sin \frac{x}{2}}{\cos \frac{x}{2}}} = \frac{\cos x \cdot \cos \frac{x}{2}}{\cos x \cdot \cos \frac{x}{2} + \sin x \sin \frac{x}{2}} = \\ &= \frac{\cos x \cdot \cos \frac{x}{2}}{\cos \left(x - \frac{x}{2}\right)} = \frac{\cos x \cdot \cos \frac{x}{2}}{\cos \frac{x}{2}} = \cos x.\end{aligned}$$

(Mayer Lajos, Győr.)