

**Zadatak 14.** Ako je  $\operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}\left(\frac{\pi}{4} + \alpha\right) = p$ , koliko je  $\operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right)$ ?

*Rješenje.*

$$\begin{aligned} \left[\operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}\left(\frac{\pi}{4} + \alpha\right)\right]^2 &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) \cdot \operatorname{tg}\left(\frac{\pi}{4} + \alpha\right) \\ &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) \cdot \frac{\sin\left(\frac{\pi}{4} + \alpha\right)}{\cos\left(\frac{\pi}{4} + \alpha\right)} \\ &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) \cdot \frac{\cos\left(\frac{\pi}{2} - \frac{\pi}{4} - \alpha\right)}{\sin\left(\frac{\pi}{2} - \frac{\pi}{4} - \alpha\right)} \\ &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) \cdot \frac{\cos\left(\frac{\pi}{4} - \alpha\right)}{\sin\left(\frac{\pi}{4} - \alpha\right)} \\ &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \operatorname{tg}\left(\frac{\pi}{4} - \alpha\right) \cdot \operatorname{ctg}\left(\frac{\pi}{4} - \alpha\right) \\ &= \operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) + 2 \\ &= p^2; \end{aligned}$$

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$$\operatorname{tg}^2\left(\frac{\pi}{4} - \alpha\right) + \operatorname{tg}^2\left(\frac{\pi}{4} + \alpha\right) = p^2 - 2.$$