

- Zadatak 12.**
- 1) $4 \sin x \cdot \cos\left(\frac{\pi}{2} - x\right) + 4 \sin(\pi + x) \cdot \cos x$
 $+ 2 \sin\left(\frac{3\pi}{2} - x\right) \cdot \cos(\pi + x) = 1;$
 - 2) $2 \sin x \cdot \cos\left(\frac{3\pi}{2} + x\right) - 3 \sin(\pi - x) \cdot \cos x$
 $+ \sin\left(\frac{\pi}{2} + x\right) \cdot \cos x = 0.$

Rješenje.

1)

$$\begin{aligned} &4 \sin x \cdot \cos\left(\frac{\pi}{2} - x\right) + 4 \sin(\pi + x) \cdot \cos x + 2 \sin\left(\frac{3\pi}{2} - x\right) \cdot \cos(\pi + x) = 1 \\ &4 \sin x \cdot \left(\cos \frac{\pi}{2} \cos x + \sin \frac{\pi}{2} \sin x\right) + 4(\sin \pi \cos x + \cos \pi \sin x) \cdot \cos x + 2\left(\sin \frac{3\pi}{2} \cos x - \cos \frac{3\pi}{2} \sin x\right) \\ &4 \sin^2 x - 4 \sin x \cos x + 2(-\cos x)(-\cos x) = 1 \\ &4 \sin^2 x - 4 \sin x \cos x + 2 \cos^2 x - \sin^2 x - \cos^2 x = 0 \\ &3 \sin^2 x - 4 \sin x \cos x + \cos^2 x = 0 \quad / : \cos^2 x \\ &3 \operatorname{tg}^2 x - 4 \operatorname{tg} x + 1 = 0 \\ &(\operatorname{tg} x)_{1,2} = \frac{4 \pm \sqrt{16 - 12}}{6} = \frac{4 \pm 2}{6} \\ &(\operatorname{tg} x)_1 = 1 \implies x_1 = \frac{\pi}{4} + k\pi, \quad k \in \mathbf{Z}; \\ &(\operatorname{tg} x)_2 = \frac{1}{3} \implies x_2 = \operatorname{arc} \operatorname{tg} \frac{1}{3} + k\pi, \quad k \in \mathbf{Z} \end{aligned}$$

2)

$$\begin{aligned} &2 \sin x \cdot \cos\left(\frac{3\pi}{2} + x\right) - 3 \sin(\pi - x) \cdot \cos x + \sin\left(\frac{\pi}{2} + x\right) \cdot \cos x = 0 \\ &2 \sin x \cdot \left(\cos \frac{3\pi}{2} \cos x - \sin \frac{3\pi}{2} \sin x\right) - 3(\sin \pi \cos x - \cos \pi \sin x) \cdot \cos x \\ &+ \left(\sin \frac{\pi}{2} \cos x + \cos \frac{\pi}{2} \sin x\right) \cdot \cos x = 0 \\ &2 \sin^2 x - 3 \cos x \sin x + \cos^2 x = 0 \quad / : \cos^2 x \\ &2 \operatorname{tg}^2 x - 3 \operatorname{tg} x + 1 = 0 \\ &(\operatorname{tg} x)_{1,2} = \frac{3 \pm \sqrt{9 - 8}}{4} = \frac{3 \pm 1}{4} \\ &(\operatorname{tg} x)_1 = 1 \implies x_1 = \frac{\pi}{4} + k\pi, \quad k \in \mathbf{Z}; \\ &(\operatorname{tg} x)_2 = \frac{1}{2} \implies x_2 = \operatorname{arc} \operatorname{tg} \frac{1}{2} + k\pi, \quad k \in \mathbf{Z} \end{aligned}$$