

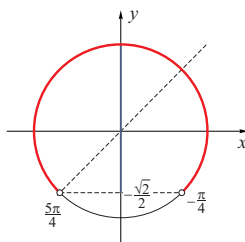
- Zadatak 7.**
- 1) $\sin 3x \cdot \cos x - \cos 3x \cdot \sin x \geq -\frac{\sqrt{2}}{2}$;
 - 2) $\cos 1.5x \cdot \cos x + \sin 1.5x \cdot \sin x \leq -\frac{\sqrt{3}}{2}$;
 - 3) $\frac{\operatorname{tg} x - \operatorname{tg} \frac{\pi}{5}}{1 + \operatorname{tg} x \cdot \operatorname{tg} \frac{\pi}{5}} > -\sqrt{3}$;
 - 4) $\frac{\operatorname{tg} x + \operatorname{tg} \frac{\pi}{5}}{1 - \operatorname{tg} x \cdot \operatorname{tg} \frac{\pi}{5}} \leq \sqrt{3}$.

Rješenje. 1)

$$\sin 3x \cdot \cos x - \cos 3x \cdot \sin x \geq -\frac{\sqrt{2}}{2}$$

$$\sin(3x - x) \geq -\frac{\sqrt{2}}{2}$$

$$\sin 2x \geq -\frac{\sqrt{2}}{2}$$



$$-\frac{\pi}{4} + 2k \cdot \pi \leq 2x \leq \frac{5\pi}{4} + 2k \cdot \pi, \quad k \in \mathbf{Z};$$

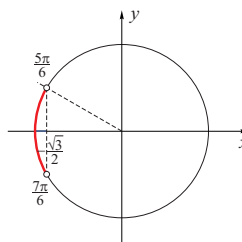
$$-\frac{\pi}{8} + k \cdot \pi \leq x \leq \frac{5\pi}{8} + k \cdot \pi, \quad k \in \mathbf{Z};$$

2)

$$\cos 1.5x \cdot \cos x + \sin 1.5x \cdot \sin x \leq -\frac{\sqrt{3}}{2}$$

$$\cos(1.5x - x) \leq -\frac{\sqrt{3}}{2}$$

$$\cos \frac{x}{2} \leq -\frac{\sqrt{3}}{2}$$



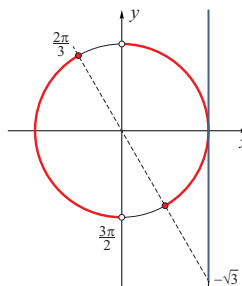
$$\frac{5\pi}{6} + 2k \cdot \pi \leq x \leq \frac{7\pi}{6} + 2k \cdot \pi, \quad k \in \mathbf{Z};$$

$$\frac{5\pi}{3} + 4k \cdot \pi \leq x \leq \frac{7\pi}{3} + 4k \cdot \pi, \quad k \in \mathbf{Z};$$

3)

$$\frac{\operatorname{tg} x - \operatorname{tg} \frac{\pi}{5}}{1 + \operatorname{tg} x \cdot \operatorname{tg} \frac{\pi}{5}} > -\sqrt{3}; \quad \left(x \neq \frac{\pi}{2} + k\pi, \quad k \in \mathbf{Z}\right)$$

$$\operatorname{tg}\left(x - \frac{\pi}{5}\right) > -\sqrt{3}$$



$$\frac{2\pi}{3} + k \cdot \pi < x - \frac{\pi}{5} < \frac{3\pi}{2} + k \cdot \pi, \quad k \in \mathbf{Z};$$

$$\frac{13\pi}{15} + k \cdot \pi < x < \frac{17\pi}{10} + k \cdot \pi, \quad k \in \mathbf{Z};$$

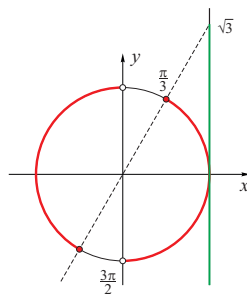
$$-\frac{2\pi}{15} + k \cdot \pi < x < \frac{7\pi}{10} + k \cdot \pi, \quad x \neq \frac{\pi}{2} + k\pi, \quad k \in \mathbf{Z};$$

$$\Rightarrow x \in \left\langle -\frac{2\pi}{15} + k \cdot \pi, \frac{\pi}{2} + k\pi \right\rangle \cup \left\langle \frac{\pi}{2} + k\pi, \frac{7\pi}{10} + k \cdot \pi \right\rangle$$

4)

$$\frac{\operatorname{tg} x + \operatorname{tg} \frac{\pi}{5}}{1 - \operatorname{tg} x \cdot \operatorname{tg} \frac{\pi}{5}} \leq \sqrt{3}; \quad \left(x \neq \frac{\pi}{2} + k\pi, \quad k \in \mathbf{Z}\right)$$

$$\operatorname{tg}\left(x + \frac{\pi}{5}\right) \leq \sqrt{3}$$



$$\frac{\pi}{2} + k \cdot \pi < x + \frac{\pi}{5} \leq \frac{4\pi}{3} + k \cdot \pi, \quad k \in \mathbf{Z};$$

$$\frac{3\pi}{10} + k \cdot \pi < x \leq \frac{17\pi}{15} + k \cdot \pi, \quad \left(x \neq \frac{\pi}{2} + k\pi, \quad k \in \mathbf{Z}\right), \quad k \in \mathbf{Z};$$

$$\Rightarrow x \in \left\langle \frac{3\pi}{10} + k \cdot \pi, \frac{\pi}{2} + k\pi \right\rangle \cup \left\langle \frac{\pi}{2} + k\pi, \frac{17\pi}{15} + k \cdot \pi \right]$$