

Zadatak 10.

Izračunaj $\sin x$ ako je
 $4 \sin^2 x = 7(1 + \cos x)$, $x \in \langle 3, 4 \rangle$.

Rješenje.

$$\left. \begin{array}{l} x \in \langle 3, 4 \rangle \\ 3 \text{ rad} = 171.88^\circ \\ 4 \text{ rad} = 229.183^\circ \end{array} \right\} \implies \text{II. i III. kvadrant} \implies \cos x < 0$$

$$4 \sin^2 x = 7(1 + \cos x)$$

$$4(1 - \cos^2 x) = 7(1 + \cos x)$$

$$-4 \cos^2 x - 7 \cos x - 3 = 0 \quad / \cdot (-1)$$

$$4 \cos^2 x + 7 \cos x + 3 = 0 \quad / \cdot (-1)$$

$$\cos x_{1,2} = \frac{-7 \pm \sqrt{49 - 48}}{8} = \frac{-7 \pm 1}{8} \implies \cos x_1 = -\frac{3}{4}, \quad \cos x_2 = -1;$$

$$\sin(3 \text{ rad}) = 0.14, \quad \sin(4 \text{ rad}) = -0.75 \implies \sin x \in [-0.75, 0.14]$$

$$\sin x = \pm \sqrt{1 - \cos^2 x}$$

$$\sin x_1 = \pm \sqrt{1 - \frac{9}{16}} = \pm \sqrt{\frac{7}{16}} = \pm \frac{\sqrt{7}}{4} = \pm 0.66$$

$$\implies \sin x_1 = -\frac{\sqrt{7}}{4} \quad (\text{druga vrijednost nije u traženom intervalu})$$

$$\sin x_2 = \pm \sqrt{1 - 1} = \pm 0 = 0$$

$$\implies \sin x_2 = 0$$

$$\text{Dakle, } \sin x = -\frac{\sqrt{7}}{4} \text{ ili } \sin x = 0.$$