

Zadatak 24. Duljina polumjera trokutu $\triangle ABC$ opisane kružnice jednaka je 7 cm, opseg trokuta iznosi 25 cm, te je $\beta = 46^\circ$. Kolike su duljine stranica trokuta?

Rješenje.

$$R = 7 \text{ cm}$$

$$o = 25 \text{ cm}$$

$$\beta = 46^\circ$$

$$a, b, c = ?$$

$$b = 2R \sin \beta = 10.07 \text{ cm} \approx 10 \text{ cm}$$

$$o = a + b + c \implies a + c = o - b = 15 \text{ cm}$$

$$b^2 = a^2 + c^2 - 2ac \cos \beta$$

$$b^2 = (a + c)^2 - 2ac - 2ac \cos \beta$$

$$b^2 = (a + c)^2 - 2ac(1 + \cos \beta)$$

$$100 = 225 - 2ac \cdot 1.69466$$

$$ac = 36.88$$

$$a + c = 15 \implies c = 15 - a$$

$$a(15 - a) = 36.88$$

$$-a^2 + 15a - 36.88 = 0 \quad / \cdot (-1)$$

$$a^2 - 15a + 36.88 = 0$$

$$a_{1,2} = \frac{15 \pm \sqrt{225 - 147.5222}}{2} = \frac{15 \pm 8.8}{2}$$

$$\implies a_1 = 11.9 \text{ cm}, \quad a_2 = 3.1 \text{ cm}$$

$$\implies c_1 = 3.1 \text{ cm}, \quad c_2 = 11.9 \text{ cm}$$