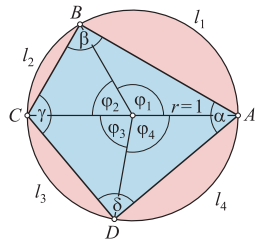
Zadatak 9. Točkama A, B, C i D kružnica je podijeljena na lukove čije su duljine u omjeru $6:3:4:5$.

Izrazi u radijanima glavne mjere središnjih kutova koji pripadaju lukovima što su određeni točkama A, B, C i D.

Izrazi u radijanima glavne mjere unutarnjih kutova četverokuta $ABCD$.

Rješenje.



Kutovi mjereni u radijanima se međusobno odnose kao i pripradajući lukovi pa vrijedi:

$$\varphi_1 : \varphi_2 : \varphi_3 : \varphi_4 = 6:3:4:5$$

$$\varphi_1 + \varphi_2 + \varphi_3 + \varphi_4 = 2r\pi$$

$$\text{uzmimo } r = 1 \implies \varphi_1 = 6x,\ \varphi_2 = 3x,\ \varphi_3 = 4x,\ \varphi_4 = 5x$$

$$6x + 3x + 4x + 5x = 2\pi$$

$$18x = 2\pi$$

$$x = \frac{\pi}{9}$$

$$\varphi_1 = 6x = 6 \cdot \frac{\pi}{9} = \frac{2\pi}{3} = 2.0944$$

$$\varphi_2 = 3x = 3 \cdot \frac{\pi}{9} = \frac{\pi}{3} = 1.0472$$

$$\varphi_3 = 4x = 4 \cdot \frac{\pi}{9} = \frac{4\pi}{9} = 1.3963$$

$$\varphi_4 = 5x = 5 \cdot \frac{\pi}{9} = \frac{5\pi}{9} = 1.7453$$

$$\alpha = \frac{\pi - \varphi_1}{2} + \frac{\pi - \varphi_4}{2} = \frac{2\pi - (\varphi_1 + \varphi_4)}{2} = \frac{2\pi - \left(\frac{2\pi}{3} + \frac{5\pi}{9}\right)}{2} = \frac{7\pi}{18} = 1.2217$$

$$\beta = \frac{2\pi - (\varphi_1 + \varphi_2)}{2} = \frac{2\pi - \left(\frac{2\pi}{3} + \frac{\pi}{3}\right)}{2} = \frac{\pi}{2} = 1.5708$$

$$\gamma = \frac{2\pi - (\varphi_2 + \varphi_3)}{2} = \frac{2\pi - \left(\frac{\pi}{3} + \frac{4\pi}{9}\right)}{2} = \frac{2\pi - \frac{7\pi}{9}}{2} = \frac{11\pi}{18} = 1.9199$$

$$\delta = \frac{2\pi - (\varphi_3 + \varphi_4)}{2} = \frac{2\pi - \left(\frac{4\pi}{9} + \frac{5\pi}{9}\right)}{2} = \frac{\pi}{2} = 1.5708$$