

Zadatak 10.

Duljine osnovica trapeza jednake su $a = 7.2$ cm i $c = 3$ cm, a duljine krakova $b = 5.5$ cm i $d = 3.8$ cm. Koliki su unutarnji kutovi trapeza i kolike su duljine dijagonala trapeza?

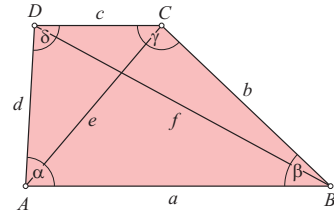
Rješenje.

$$a = 7.2 \text{ cm}$$

$$b = 5.5 \text{ cm}$$

$$c = 3 \text{ cm}$$

$$d = 3.8 \text{ cm}$$



$$\alpha, \beta, \gamma, \delta, e, f = ?$$

$$\alpha + \gamma = 180^\circ \implies \cos \gamma = -\cos \alpha$$

$$\beta + \delta = 180^\circ \implies \cos \delta = -\cos \beta$$

$$e^2 = a^2 + b^2 - 2ab \cos \beta$$

$$e^2 = c^2 + d^2 - 2cd \cos \delta$$

$$\left. \begin{array}{l} e^2 = a^2 + b^2 - 2ab \cos \beta \\ e^2 = c^2 + d^2 + 2cd \cos \beta \end{array} \right\} -$$

$$a^2 + b^2 - c^2 - d^2 - \cos \beta(2ab + 2cd) = 0$$

$$\cos \beta = \frac{a^2 + b^2 - c^2 - d^2}{2(ab + cd)} \implies \beta = 43^\circ 36' 44''$$

$$\left. \begin{array}{l} f^2 = a^2 + d^2 - 2ad \cos \alpha \\ f^2 = b^2 + c^2 + 2bc \cos \gamma \end{array} \right\} -$$

$$a^2 + d^2 - b^2 - c^2 - 2 \cos \alpha(ad + bc) = 0$$

$$\cos \alpha = \frac{a^2 + d^2 - b^2 - c^2}{2(ad + bc)} \implies \alpha = 86^\circ 42' 48''$$

$$\gamma = 180^\circ - \alpha = 93^\circ 17' 12''$$

$$\delta = 180^\circ - \beta = 136^\circ 23' 16''$$

$$e^2 = a^2 + b^2 - 2ab \cos \beta \implies e = 4.97 \text{ cm}$$

$$f^2 = a^2 + d^2 - 2ad \cos \alpha \implies f = 7.95 \text{ cm}$$