

**Zadatak 21.** Kolike su duljine stranica  $b$  i  $c$  te kutovi trokuta  $ABC$  ako je  $a = 9$  cm,  $t_b = 11$  cm i  $t_c = 8$  cm?

**Rješenje.**

$$a = 9 \text{ cm}$$

$$t_b = 11 \text{ cm}$$

$$t_c = 8 \text{ cm}$$

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$$b, c, \alpha, \beta, \gamma = ?$$

$\triangle BCT$

(težište dijeli težišnicu od vrha u omjeru 2 : 1.)

$$\cos \varphi = \frac{\left(\frac{2}{3}t_b\right)^2 + \left(\frac{2}{3}t_c\right)^2 - a^2}{2 \cdot \frac{2}{3}t_b \cdot \frac{2}{3}t_c} \implies \varphi = 89^\circ 6' 17''$$

$$\varphi' = 180^\circ - \varphi = 90^\circ 53' 43''$$

$\triangle TCB_1$

$$\left(\frac{b}{2}\right)^2 = \left(\frac{2}{3}t_c\right)^2 + \left(\frac{1}{3}t_b\right)^2 - 2 \cdot \frac{2}{3}t_c \cdot \frac{1}{3}t_b \cdot \cos \varphi' \implies b = 13 \text{ cm}$$

$\triangle BTC_1$

$$\left(\frac{c}{2}\right)^2 = \left(\frac{2}{3}t_b\right)^2 + \left(\frac{1}{3}t_c\right)^2 - 2 \cdot \frac{2}{3}t_b \cdot \frac{1}{3}t_c \cdot \cos \varphi' \implies c = 15.68 \text{ cm}$$

$$\cos \alpha = \frac{b^2 + c^2 - a^2}{2bc} \implies \alpha = 35^\circ$$

$$\cos \beta = \frac{a^2 + c^2 - b^2}{2ac} \implies \beta = 56^\circ$$

$$\gamma = 180^\circ - \alpha - \beta = 89^\circ.$$

