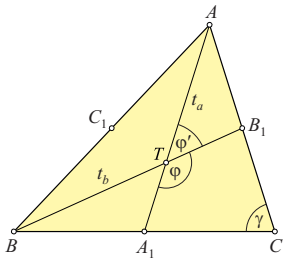
Zadatak 22.

Ako su $t_a = 4.8$ cm i $t_b = 3.7$ cm duljine dviju težišnica trokuta $\triangle ABC$, a $\varphi = 100^\circ$ kut što ga te težišnice zatvaraju, izračunaj površinu trokuta.

Rješenje.



$t_a = 4.8\,\text{cm}$

$t_b = 3.7\,\text{cm}$

$\varphi = 100^\circ$

$P = ?$

$\varphi' = 180^\circ - \varphi = 80^\circ$

$\triangle TB_1A$

$$\left(\frac{b}{2}\right)^2 = \left(\frac{1}{3}t_b\right)^2 + \left(\frac{2}{3}t_a\right)^2 - 2\cdot\frac{1}{3}t_b\cdot\frac{2}{3}t_a\cdot\cos\varphi' \implies b = 6.45\,\text{cm}$$

$\triangle BA_1T$

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

$\triangle BCB_1$

$$\cos\gamma = \frac{a^2 + \left(\frac{b}{2}\right)^2 - t_b^2}{2\cdot a\cdot\frac{b}{2}} \implies \gamma = 42^\circ 10' 47''$$

$$P = \frac{ab\sin\gamma}{2} = 11.67\,\text{cm}^2.$$