

**Zadatak 15.** Točke  $A_1$ ,  $B_1$  i  $C_1$  nožišta su visina spuštenih iz vrhova na stranice trokuta  $\triangle ABC$ . Ako su zadani kutovi trokuta  $\triangle ABC$ , koliki je omjer površina trokuta  $\triangle A_1B_1C_1$  i trokuta  $\triangle ABC$ ?

**Rješenje.**

Vrijedi

$$\begin{aligned} P_{\triangle AC_1B_1} &= \frac{1}{2} \cdot |AC_1| \cdot |AB_1| \cdot \sin \alpha \\ &= \frac{1}{2} \cdot |AB| \cdot |AC| \cdot \sin \alpha \cdot \cos^2 \alpha \\ &= P_{\triangle ABC} \cdot \cos^2 \alpha. \end{aligned}$$

Analogno tome,  $P_{\triangle A_1C_1B} = P_{\triangle ABC} \cdot \cos^2 \beta$  i  $P_{\triangle A_1CB_1} = P_{\triangle ABC} \cdot \cos^2 \gamma$ . I sada,

$$P_{\triangle ABC} - P_{\triangle A_1B_1C_1} = P_{\triangle ABC}(\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma),$$

odnosno,

$$\frac{P_{\triangle A_1B_1C_1}}{P_{\triangle ABC}} = 1 - \cos^2 \alpha - \cos^2 \beta - \cos^2 \gamma.$$

Razmotri zadatak za pravokutni, pa i za tupokutni trokut.

