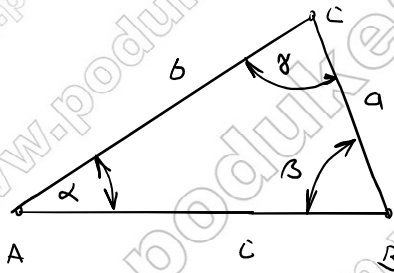


10. Kutovi trokuta u omjeru su 4 : 5 : 6. Kolika je duljina najkraće stranice trokuta ako je duljina najdulje 16.3 cm?

Zadano: $\alpha : \beta : \gamma = 4 : 5 : 6$ $c = 16,3 \text{ cm}$

Traži se: $a = ?$

Skica



Kod trokuta vrijedi pravilo: nasuprot većeg kuta nalazi se veća stranica.

1. Sinusni poučak

$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} \Rightarrow \frac{a}{\sin \alpha} = \frac{c}{\sin \gamma}$$

$$a = c \cdot \frac{\sin \alpha}{\sin \gamma} \quad (1)$$

2. Kutovi trokuta

$$\alpha + \beta + \gamma = 180^\circ \quad (2)$$

$$\alpha : \beta : \gamma = 4 : 5 : 6$$

$$\frac{\alpha}{4} = \frac{\beta}{5} = \frac{\gamma}{6} = k \quad (3)$$

$$\alpha = 4k$$

$$\beta = 5k$$

$$\gamma = 6k$$

$$4k + 5k + 6k = 180^\circ$$

$$15k = 180^\circ$$

$$k = \frac{180^\circ}{15}$$

$$k = 12^\circ$$

$$\alpha = 4 \cdot k = 4 \cdot 12^\circ$$

$$\beta = 5 \cdot k = 5 \cdot 12^\circ$$

$$\gamma = 6 \cdot k = 6 \cdot 12^\circ$$

$$\alpha = 48^\circ$$

$$\beta = 60^\circ$$

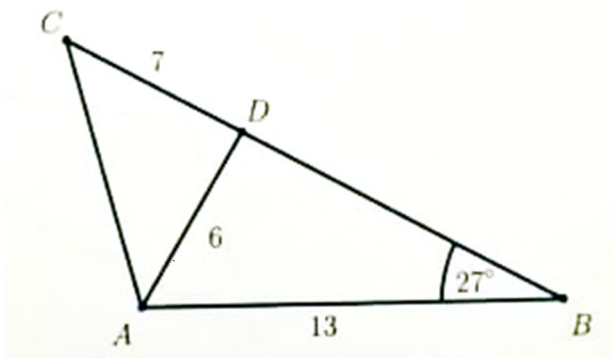
$$\gamma = 72^\circ$$

Iz (1):

$$a = 16,3 \cdot \frac{\sin 48^\circ}{\sin 72^\circ}$$

$$\underline{a = 12,74 \text{ cm}}$$

17. Zadan je trokut ABC i točka D na stranici $\overline{BC}$ kao na slici. Izračunajte površinu trokuta ABC .



1. Površina trokuta

$$P = \frac{1}{2} a \cdot v_a$$

$$P = \frac{1}{2} \cdot |BC| \cdot v_a$$

Sa slike:

$$1) v_a = |AB| \cdot \sin B$$

$$v_a = 13 \cdot \sin(27^\circ)$$

$$v_a = 5,90 \text{ cm}$$

$$2) |BC| = |BD| + |CD|$$

$$3) \frac{|AD|}{\sin B} = \frac{|AB|}{\sin \delta_1}$$

$$\frac{6}{\sin 27^\circ} = \frac{13}{\sin \delta_1}$$

$$\sin \delta_1 = \frac{13}{6} \cdot \sin 27^\circ$$

$$\delta_1 = 79,6237^\circ$$

$$4) \alpha_1 + \beta + \delta_1 = 180^\circ$$

$$\alpha_1 = 180^\circ - \beta - \delta_1$$

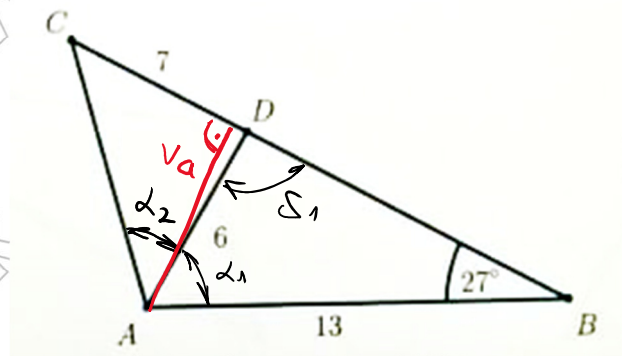
$$\alpha_1 = 180^\circ - 27^\circ - 79,6237^\circ$$

$$\alpha_1 = 73,3763^\circ$$

$$5) \frac{|BD|}{\sin \alpha_1} = \frac{|AD|}{\sin \beta}$$

$$|BD| = |AD| \cdot \frac{\sin \alpha_1}{\sin \beta}$$

$$|BD| = 6 \cdot \frac{\sin(73,3763^\circ)}{\sin(27^\circ)}$$



$$|BD| = 12,66$$

$$|BC| = 12,66 + 7 = 19,66$$

$$P = \frac{1}{2} \cdot 19,66 \cdot 5,3$$

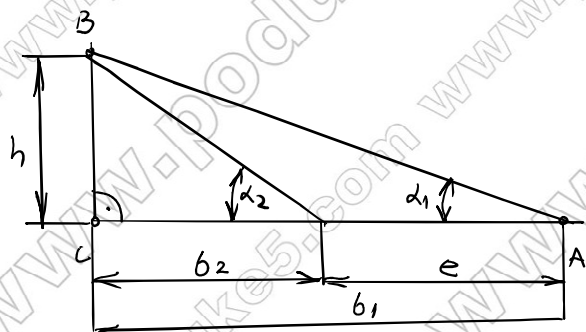
$$P = 52$$

23. Vrh stabla vidi se pod kutom elevacije $20^\circ 40'$. Kada se pomaknemo za 10 metara prema stablu, vrh vidimo pod kutom elevacije $27^\circ 50'$. Kolika je visina stabla (uz pretpostavku da točke promatranja i podnožje stabla leže u istoj horizontalnoj ravnini)?

Zadano: $\alpha_1 = 20^\circ 40'$, $\alpha_2 = 27^\circ 50'$, $e = 10\text{ m}$

Traži se: $h = ?$

Skica



1. Visina stabla, h

$$\operatorname{tg} \alpha_1 = \frac{h}{b_1} \quad (1) \quad h = ? \quad b_1 = ?$$

$$b_1 = \frac{h}{\operatorname{tg} \alpha_1} \quad (2)$$

2. Visina stabla, h

$$\operatorname{tg} \alpha_2 = \frac{h}{b_2} \quad (3)$$

$$b_2 = \frac{h}{\operatorname{tg} \alpha_2} \quad (4)$$

Sa slike:

$$b_1 - b_2 = e$$

$$\frac{h}{\operatorname{tg} \alpha_1} - \frac{h}{\operatorname{tg} \alpha_2} = e$$

$$h \left(\frac{1}{\operatorname{tg} \alpha_1} - \frac{1}{\operatorname{tg} \alpha_2} \right) = e$$

$$h = \frac{e}{\frac{1}{\operatorname{tg} \alpha_1} - \frac{1}{\operatorname{tg} \alpha_2}} \quad [\text{m}]$$

$$h = \frac{10}{\frac{1}{\operatorname{tg}(20^\circ 40')} - \frac{1}{\operatorname{tg}(27^\circ 50')}} \quad [\text{m}]$$

$$h = 13,203 \text{ m}$$