

1) Soit un triangle quelconque ABC.

b) On donne  $a = BC = 35$ ,  $b = AC = 12$  et  $c = AB = 25$ .

Calculer  $\alpha$ ,  $\beta$  et  $\gamma$ .

c) On donne  $b = AC = 23,2$  et  $c = AB = 36,7$  et  $\beta = 36,4^\circ$ .

Calculer  $\alpha$ ,  $\gamma$  et  $a = BC$ .

c) On donne :

$$a = BC = 35$$

$$b = AC = 12$$

$$c = AB = 25$$

Calculer

$\alpha$ ,  $\beta$  et  $\gamma$ .

Résolution :

thm du cosinus :

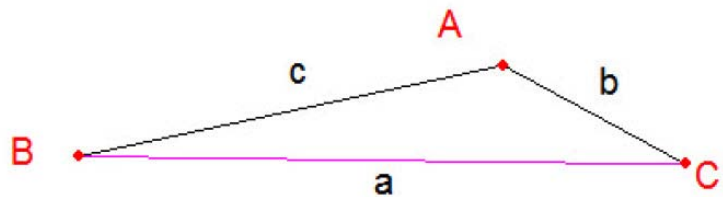
$$a^2 = b^2 + c^2 - 2bc \cos(\alpha) \Leftrightarrow -\cos(\alpha) = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\text{- a.m.: } \cos(\alpha) = \frac{144 + 625 - (35)^2}{2 \cdot 12 \cdot 25} = \frac{-19}{25} \Rightarrow \alpha \approx 139,46^\circ$$

$$b^2 = a^2 + c^2 - 2ac \cos(\beta) \Leftrightarrow \cos(\beta) = \frac{a^2 + c^2 - b^2}{2ac}$$

$$\text{- a.m.: } \cos(\beta) = \frac{35^2 + 625 - 144}{2 \cdot 35 \cdot 25} = \frac{853}{875} \Rightarrow \beta \approx 12,88^\circ$$

$$\text{et donc } \gamma = 180^\circ - \alpha - \beta \approx 27,66^\circ$$



1c) Données:

$$b = AC = 23,2$$

$$c = AB = 36,7$$

$$\beta = 36,4^\circ$$

Calculer

$$\alpha, \gamma \text{ et } a = BC$$

Résolution

Thm du sinus:

$$\frac{b}{\sin(\beta)} = \frac{c}{\sin(\gamma)} \Leftrightarrow \sin(\gamma) = \frac{c}{b} \cdot \sin(\beta)$$

$$\sim a.n. \quad \sin(\gamma) = \frac{36,7}{23,2} \cdot \sin(36,4^\circ) \cong 0,939$$

$$\Rightarrow \gamma_1 \cong 69,84^\circ$$

ou

$$\gamma_2 \cong 110,16^\circ$$

$$\text{d'où } \alpha_1 = 180 - \beta - \gamma_1 = 73,76^\circ$$

$$\alpha_2 = 180 - \beta - \gamma_2 = 33,44^\circ$$

puis

$$\frac{a_1}{\sin(\alpha_1)} = \frac{b}{\sin(\beta)} \Leftrightarrow a_1 = b \cdot \frac{\sin(\alpha_1)}{\sin(\beta)} \quad \text{et } a_1 \approx 37,54$$

$$\text{de même } a_2 = b \cdot \frac{\sin(\alpha_2)}{\sin(\beta)} \quad \text{et } a_2 \approx 21,54$$

