

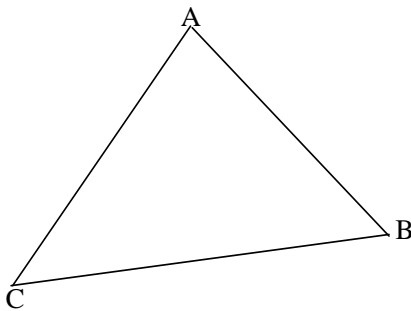
NOM : Prénom : Classe : Date :

Corrigé

20

1)

$AC = 6 ; \hat{A} = 45^\circ ; \hat{C} = 30^\circ$



Calculer \hat{B} ; BC ; AB

$\hat{B} = 180 - (\hat{A} + \hat{C}) \Rightarrow \hat{B} = 180 - (45 + 30) \Rightarrow \hat{B} = 180 - 75$

$\Rightarrow \hat{B} = 105^\circ$

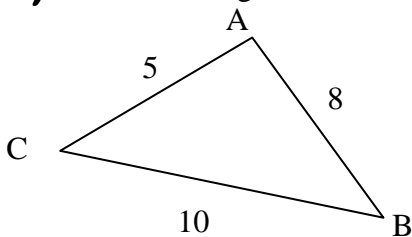
$\frac{AB}{\sin \hat{C}} = \frac{BC}{\sin \hat{A}} = \frac{AC}{\sin \hat{B}}$

$\Rightarrow BC = \frac{AC \times \sin \hat{A}}{\sin \hat{B}} \Rightarrow BC = \frac{6 \times \sin 45^\circ}{\sin 105^\circ} \Rightarrow BC = \frac{6 \times 0,707}{0,966} \Rightarrow$

BC \approx 4,39

$AB = \frac{AC \times \sin \hat{C}}{\sin \hat{B}} \Rightarrow AB = \frac{6 \times \sin 30^\circ}{\sin 105^\circ} \Rightarrow AB = \frac{6 \times 0,5}{0,966} \Rightarrow$ **AB \approx 3,1**

2) Calculer les angles \hat{A} , \hat{B} et \hat{C} .



$BC^2 = AC^2 + AB^2 - 2 \times AC \times AB \times \cos \hat{A}$

$10^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos \hat{A}$

$80 \cos \hat{A} = 25 + 64 - 100 \Rightarrow 80 \cos \hat{A} = -11 \Rightarrow \cos \hat{A} = \frac{-11}{80}$

$\Rightarrow \cos \hat{A} = -0,1375 \Rightarrow$ **$\hat{A} \approx 97,9^\circ$**

$\frac{AB}{\sin \hat{C}} = \frac{BC}{\sin \hat{A}} = \frac{AC}{\sin \hat{B}}$

$\sin \hat{C} = \frac{AB \times \sin \hat{A}}{BC} \Rightarrow \sin \hat{C} = \frac{8 \times \sin 97,9^\circ}{10} \Rightarrow \sin \hat{C} \approx 0,8 \times 0,99 \Rightarrow \sin \hat{C} \approx 0,792 \Rightarrow$ **$\hat{C} \approx 52,41^\circ$**

$\hat{B} = 180 - (\hat{A} + \hat{C}) \Rightarrow \hat{B} = 180 - (97,9 + 52,41) \Rightarrow$ **$\hat{B} = 29,69^\circ$**

3) Un géomètre veut vérifier la distance entre deux bornes A et B, séparée par une rivière.

Il place un appareil en A et C distants de 25 m pour mesurer deux angles : $\hat{A} \approx 51,1^\circ$ et $\hat{C} \approx 86,3^\circ$

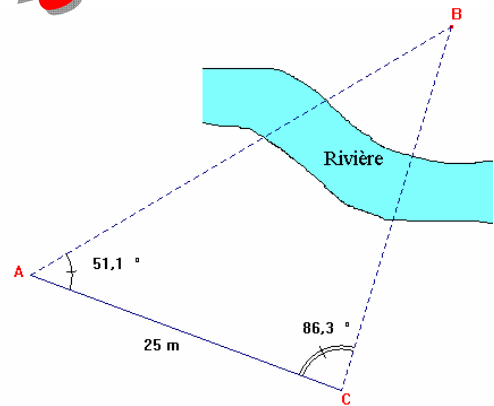
Calculer la distance AB.

Corrigé

$$\frac{AB}{\sin \hat{C}} = \frac{AC}{\sin \hat{B}} = \frac{BC}{\sin \hat{A}} \Rightarrow AB = \frac{AC \times \sin \hat{C}}{\sin \hat{B}}$$

$$\hat{B} = 180 - (51,1 + 86,3) = 180 - 137,4 = 42,6^\circ$$

$$\Rightarrow AB = \frac{25 \times \sin 86,3^\circ}{\sin 42,6^\circ} \Rightarrow AB = \frac{25 \times 0,998}{0,677} \Rightarrow \mathbf{AB \approx 36,86 \text{ m}}$$



4) Soit le triangle ABC, on donne : $\hat{A} = 40^\circ$; $b = 40$; $\hat{B} = 30^\circ$.

Calculer a.

$$\frac{a}{\sin \hat{A}} = \frac{b}{\sin \hat{B}} \Rightarrow a = \frac{b \times \sin \hat{A}}{\sin \hat{B}} \Rightarrow a = \frac{40 \times \sin 40^\circ}{\sin 30^\circ} \Rightarrow a = \frac{40 \times 0,643}{0,5} \Rightarrow \mathbf{a = 51,4}$$

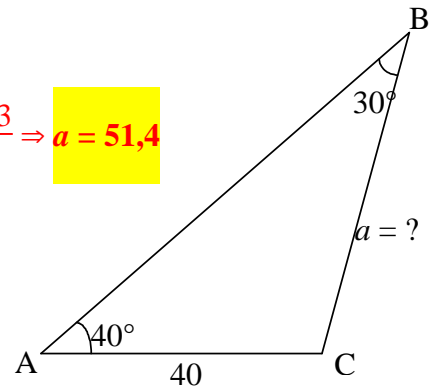
Calculer AB.

$$AB^2 = AC^2 + BC^2 - 2 \times AC \times BC \times \cos \hat{C}$$

$$\hat{C} = 180 - (40 + 30) = 180 - 70 \Rightarrow \hat{C} = 110^\circ$$

$$AB^2 = 40^2 + 51,4^2 - 2 \times 40 \times 51,4 \times \cos 110^\circ \Rightarrow AB^2 = 1600 + 2644,33 - 4113,8 \times (-0,342) \Rightarrow 2568,1 + 1407 \Rightarrow AB^2 = 5648,3 \Rightarrow AB = \sqrt{5648,3} \Rightarrow \mathbf{AB \approx 75,2}$$

$$\text{ou } \frac{AB}{\sin \hat{C}} = \frac{AC}{\sin \hat{B}} = \frac{BC}{\sin \hat{A}} \Rightarrow AB = \frac{AC \times \sin \hat{C}}{\sin \hat{B}} \Rightarrow AB = \frac{40 \times \sin 110^\circ}{\sin 30^\circ} \Rightarrow AB = \frac{40 \times 0,9397}{0,5} \Rightarrow \mathbf{AB \approx 75,2}$$



5) Soit le triangle ABC, on donne : $b = 8$; $c = 6$; $\hat{A} = 42^\circ$. Calculer a.

$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} \Rightarrow a^2 = 8^2 + 6^2 - 2 \times 8 \times 6 \times \cos 42^\circ$$

$$a^2 = 64 + 36 - 96 \times 0,743 \Rightarrow a^2 = 100 - 71,34 \Rightarrow a^2 = 28,66$$

$$a = \sqrt{28,66} \Rightarrow \mathbf{a \approx 5,35}$$

