

## Factorisation et équations

### Exercice 1.

thm du cos :

$$a^2 = 8^2 + 7^2 - 2 \cdot 8 \cdot 7 \cdot \cos(40^\circ)$$

$$\Leftrightarrow a \simeq \boxed{5.22 \text{ u}}$$

$$\text{thm du sin : } \frac{a}{\sin(40^\circ)} = \frac{7}{\sin(\gamma)}$$

$$\Leftrightarrow \sin(\gamma) = \frac{7 \cdot \sin(40^\circ)}{a}$$

$$\Rightarrow \gamma \simeq \boxed{59.62^\circ} \quad \Rightarrow \beta \simeq \boxed{80.38^\circ}$$

$$\text{aire } \Delta ABC = \frac{1}{2} \cdot 7 \cdot 8 \cdot \sin(40^\circ) \simeq \boxed{18.0 \text{ u}^2}$$

thm du cos :

$$a^2 = 9^2 + 8^2 - 2 \cdot 9 \cdot 8 \cdot \cos(35^\circ)$$

$$\Leftrightarrow a \simeq \boxed{5.2 \text{ u}}$$

$$\text{thm du sin : } \frac{a}{\sin(35^\circ)} = \frac{8}{\sin(\gamma)}$$

$$\Leftrightarrow \sin(\gamma) = \frac{8 \cdot \sin(35^\circ)}{a} \simeq$$

$$\Rightarrow \gamma \simeq \boxed{61.93^\circ} \quad \Rightarrow \beta \simeq \boxed{83.07^\circ}$$

$$\text{aire } \Delta ABC = \frac{1}{2} \cdot 8 \cdot 9 \cdot \sin(35^\circ) \simeq \boxed{20.65 \text{ u}^2}$$

### Exercice 2.

$$\sin(30^\circ) = \frac{200}{AB}$$

$$\Leftrightarrow AB = \frac{200}{\sin(30^\circ)} = 400$$

thm du cos :

$$AM^2 = 250^2 + 400^2 - 2 \cdot 250 \cdot 400 \cdot \cos(30^\circ)$$

$$\Leftrightarrow AM \simeq 222.02 \text{ m}$$

$$\text{Pytha. : } MN = \sqrt{AM^2 - 200^2} \simeq \boxed{96.41 \text{ m}}$$

$$\text{thm du sin : } \frac{AM}{\sin(30^\circ)} = \frac{250}{\sin(\alpha)}$$

$$\Leftrightarrow \sin(\alpha) = \frac{250 \cdot \sin(30^\circ)}{AM}$$

$$\Rightarrow \alpha \simeq \boxed{34.26^\circ}$$

$$\sin(30^\circ) = \frac{100}{AB}$$

$$\Leftrightarrow AB = \frac{100}{\sin(30^\circ)} = 200$$

thm du cos :

$$AM^2 = 150^2 + 200^2 - 2 \cdot 150 \cdot 200 \cdot \cos(30^\circ)$$

$$\Leftrightarrow AM \simeq 102.66 \text{ m}$$

$$\text{Pytha. : } MN = \sqrt{AM^2 - 100^2} \simeq \boxed{23.21 \text{ m}}$$

$$\text{thm du sin : } \frac{AM}{\sin(30^\circ)} = \frac{150}{\sin(\alpha)}$$

$$\Leftrightarrow \sin(\alpha) = \frac{150 \cdot \sin(30^\circ)}{AM}$$

$$\Rightarrow \alpha \simeq \boxed{46.94^\circ}$$

**Exercice 3.**

$$\text{a) } \widehat{ADC} = 180^\circ - 30^\circ - 40^\circ = 110^\circ$$

$$\text{b) thm du sin : } \frac{100}{\sin(110^\circ)} = \frac{AD}{\sin(40^\circ)}$$

$$\Rightarrow AD = \frac{100 \cdot \sin(40^\circ)}{\sin(110^\circ)} \simeq 68.4 \text{ m}$$

$$\text{c) thm du cos :}$$

$$BD^2 = 50^2 + 68.4^2 - 2 \cdot 50 \cdot 68.4 \cdot \cos(30^\circ)$$

$$\Rightarrow BD \simeq \boxed{35.43 \text{ m}}$$

$$\text{d) thm du sin : } \frac{BD}{\sin(30^\circ)} = \frac{50}{\sin(\widehat{ADB})}$$

$$\Rightarrow \sin(\widehat{ADB}) = \frac{50 \cdot \sin(30^\circ)}{BD} \simeq 0.71$$

$$\Rightarrow \widehat{ADB} \simeq 44.88$$

$$\Rightarrow \alpha = 180^\circ - 90^\circ - 30^\circ - \widehat{ADB} \simeq \boxed{15.12^\circ}$$

$$\widehat{ADC} = 180^\circ - 30^\circ - 50^\circ = 100^\circ$$

$$\text{thm du sin : } \frac{120}{\sin(100^\circ)} = \frac{AD}{\sin(50^\circ)}$$

$$\Rightarrow AD = \frac{120 \cdot \sin(50^\circ)}{\sin(100^\circ)} \simeq 93.34 \text{ m}$$

$$\text{thm du cos :}$$

$$BD^2 = 60^2 + 93.34^2 - 2 \cdot 60 \cdot 93.34 \cdot \cos(30^\circ)$$

$$\Rightarrow BD \simeq \boxed{51.11 \text{ m}}$$

$$\text{thm du sin : } \frac{BD}{\sin(30^\circ)} = \frac{60}{\sin(\widehat{ADB})}$$

$$\Rightarrow \sin(\widehat{ADB}) = \frac{60 \cdot \sin(30^\circ)}{BD} \simeq 0.59$$

$$\Rightarrow \widehat{ADB} \simeq 35.94$$

$$\Rightarrow \alpha = 180^\circ - 90^\circ - 30^\circ - \widehat{ADB} \simeq \boxed{24.06^\circ}$$