

Trigonométrie

Exercice 1.

$$a) \frac{3 \cdot 180}{5} = 108^\circ$$

$$b) \frac{180}{8} = 22.5^\circ$$

$$c) \frac{1.5 \cdot 180}{\pi} \simeq 85.94^\circ$$

$$\frac{5 \cdot 180}{6} = 150^\circ$$

$$\frac{180}{10} = 18^\circ$$

$$\frac{2.5 \cdot 180}{\pi} \simeq 143.24^\circ$$

Exercice 2.

$$a) \frac{40 \cdot \pi}{180} = \frac{2\pi}{9}$$

$$b) \frac{100 \cdot \pi}{180} = \frac{5\pi}{9}$$

$$c) \frac{75 \cdot \pi}{180} = \frac{5\pi}{12}$$

$$\frac{50 \cdot \pi}{180} = \frac{5\pi}{18}$$

$$\frac{20 \cdot \pi}{180} = \frac{\pi}{9}$$

$$\frac{135 \cdot \pi}{180} = \frac{3\pi}{4}$$

Exercice 3.

$$\alpha = \frac{670}{6370} \simeq 0.105 \simeq 6.026 \simeq 6^\circ 02'$$

$$\Rightarrow \text{latitude de } B : 42^\circ 13' \text{ N}$$

$$\alpha = \frac{850}{6370} \simeq 0.133 \simeq 7.645 \simeq 7^\circ 39'$$

$$\Rightarrow \text{latitude de } B : 37^\circ 06' \text{ N}$$

Exercice 4.

$$\sin(38^\circ) = \frac{b}{6} \Rightarrow b = \sin(38^\circ) \cdot 6 \simeq 3.69$$

$$\cos(38^\circ) = \frac{c}{6} \Rightarrow c = \cos(38^\circ) \cdot 6 \simeq 4.73$$

$$\Rightarrow \text{périmètre} = a + b + c = 14.42 \text{ cm}$$

$$\Rightarrow \text{aire} = \frac{b \cdot c}{2} = 8.73 \text{ cm}^2$$

$$\cos(25^\circ) = \frac{7}{c} \Rightarrow c = \frac{7}{\cos(25^\circ)} \simeq 7.72$$

$$\tan(25^\circ) = \frac{a}{7} \Rightarrow a = \tan(25^\circ) \cdot 7 \simeq 3.26$$

$$\Rightarrow \text{périmètre} = a + b + c = 17.99 \text{ cm}$$

$$\Rightarrow \text{aire} = \frac{a \cdot b}{2} = 11.42 \text{ cm}^2$$

Exercice 5. M milieu de BC

$$\sin(70^\circ) = \frac{CM}{4} \Rightarrow CM = \sin(70^\circ) \cdot 4 \simeq 3.76$$

$$\cos(70^\circ) = \frac{BM}{4} \Rightarrow BM = \cos(70^\circ) \cdot 4 \simeq 1.37$$

$$\Rightarrow \text{périmètre} = 2a + 2BM = 10.74 \text{ cm}$$

$$\Rightarrow \text{aire} = BM \cdot CM = 5.14 \text{ cm}^2$$

 M milieu de BC

$$\sin(25^\circ) = \frac{BM}{5} \Rightarrow BM = \sin(25^\circ) \cdot 5 \simeq 2.11$$

$$\cos(25^\circ) = \frac{AM}{5} \Rightarrow AM = \cos(25^\circ) \cdot 5 \simeq 4.53$$

$$\Rightarrow \text{périmètre} = 2b + 2BM = 14.23 \text{ cm}$$

$$\Rightarrow \text{aire} = BM \cdot AM = 9.58 \text{ cm}^2$$

Exercice 6.

$$\tan(30^\circ) = \frac{200}{BN}$$

$$\Rightarrow BN = \frac{200}{\tan(30^\circ)} \simeq 346.41 \text{ m}$$

$$\Rightarrow MN = BN - BM \simeq 96.41 \text{ m}$$

$$\tan(\alpha_1) = \frac{MN}{AN} \Rightarrow \alpha_1 \simeq 25.74^\circ$$

$$\Rightarrow \alpha = 60^\circ - \alpha_1 = 34.26^\circ$$

$$\tan(30^\circ) = \frac{180}{BN}$$

$$\Rightarrow BN = \frac{180}{\tan(30^\circ)} \simeq 311.77 \text{ m}$$

$$\Rightarrow MN = BN - BM \simeq 111.77 \text{ m}$$

$$\tan(\alpha_1) = \frac{MN}{AN} \Rightarrow \alpha_1 \simeq 31.84^\circ$$

$$\Rightarrow \alpha = 60^\circ - \alpha_1 = 28.16^\circ$$

Exercice 7.

$$\sin(41^\circ) = \frac{h}{60} \Rightarrow h = \sin(41^\circ) \cdot 60 \simeq 39.36$$

$$\alpha = 16^\circ + 32^\circ - 41^\circ = 7^\circ$$

$$\sin(7^\circ) = \frac{h}{x} \Rightarrow x = \frac{h}{\sin(7^\circ)} \simeq 322.998$$

$$\sin(48^\circ) = \frac{y}{x} \Rightarrow y = \sin(48^\circ) \cdot x \simeq 240.03$$

$$\cos(48^\circ) = \frac{d}{x} \Rightarrow d = \cos(48^\circ) \cdot x \simeq 216.13$$

$$\tan(32^\circ) = \frac{z}{d} \Rightarrow z = \tan(32^\circ) \cdot d \simeq 135.05$$

$$\Rightarrow AB = y - z \simeq 104.98 \text{ m}$$

$$\sin(38^\circ) = \frac{h}{50} \Rightarrow h = \sin(38^\circ) \cdot 50 \simeq 30.78$$

$$\alpha = 15^\circ + 31^\circ - 38^\circ = 8^\circ$$

$$\sin(8^\circ) = \frac{h}{x} \Rightarrow x = \frac{h}{\sin(8^\circ)} \simeq 221.19$$

$$\sin(46^\circ) = \frac{y}{x} \Rightarrow y = \sin(46^\circ) \cdot x \simeq 159.11$$

$$\cos(46^\circ) = \frac{d}{x} \Rightarrow d = \cos(46^\circ) \cdot x \simeq 153.65$$

$$\tan(31^\circ) = \frac{z}{d} \Rightarrow z = \tan(31^\circ) \cdot d \simeq 92.32$$

$$\Rightarrow AB = y - z \simeq 66.79 \text{ m}$$