

Cercle trigonométrique - corrigés détaillés

Exercice 9

$$360^\circ \sim 2\pi \quad 180^\circ \sim \pi \quad 90^\circ \sim \frac{\pi}{2} \quad 60^\circ \sim \frac{\pi}{3} \quad 45^\circ \sim \frac{\pi}{4} \quad 30^\circ \sim \frac{\pi}{6}$$

$$36^\circ = \frac{360^\circ}{10} = \frac{2\pi}{10} = \frac{\pi}{5}$$

$$135^\circ = 3 \cdot 45^\circ = 3 \cdot \frac{\pi}{4} = \frac{3\pi}{4}$$

$$6^\circ = \frac{360^\circ}{60} = \frac{2\pi}{60} = \frac{\pi}{30}$$

$$420^\circ = 360^\circ + 60^\circ = 2\pi + \frac{\pi}{3} = \frac{6\pi + \pi}{3} = \frac{7\pi}{3}$$

$$\frac{4\pi}{5} = \frac{2 \cdot 2\pi}{5} = \frac{2}{5} \cdot 360^\circ = 2 \cdot 72^\circ = 144^\circ$$

$$\frac{5\pi}{4} = 5 \cdot \frac{\pi}{4} = 5 \cdot 45^\circ = 225^\circ$$

$$\frac{3\pi}{10} = \frac{2\pi + \pi}{10} = \frac{360^\circ + 180^\circ}{10} = \frac{540^\circ}{10} = 54^\circ$$

Exercice 10

degrés en radians

$$x = \frac{\varphi}{360^\circ} \cdot 2\pi$$

degrés	360°	φ
radian	2π	x

$$a) \quad x = \frac{32^\circ}{360^\circ} \cdot 2\pi = 0,5585$$

Exercice 11

radians en degré

$$\varphi = \frac{x}{2\pi} \cdot 360^\circ$$

$$a) \quad \varphi = \frac{0,567}{2\pi} \cdot 360^\circ = 32,49^\circ$$

Exercice 12

$$l = \frac{\varphi}{360^\circ} \cdot \overbrace{2 \cdot r \cdot \pi}^{\text{périmètre}}$$

$$a) \quad r = 10 \quad \varphi = 37^\circ$$

$$l = \frac{37}{360} \cdot 2 \cdot 10 \cdot \pi = 6,46$$

Exercice 13

$$l = \frac{\varphi}{2\pi} \cdot 2 \cdot r \cdot \pi = r \cdot \varphi$$

$$a) \quad r = 60 \quad \varphi = 2,2$$

$$l = 60 \cdot 2,2 = 132$$

Exercise 14

a) $45^\circ = \frac{\pi}{4}$

b) $-440^\circ = -360^\circ - 80^\circ = -80^\circ$

c) $200^\circ = 180^\circ + 20^\circ$

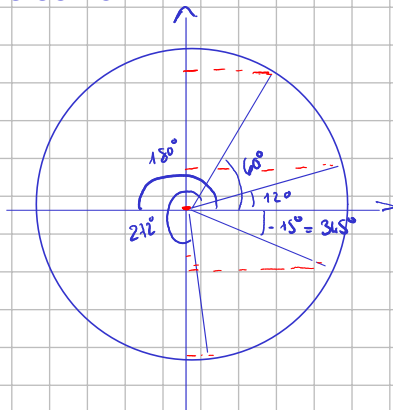
d) $-\frac{5\pi}{6} = -5 \cdot \frac{\pi}{6} = -5 \cdot 30^\circ = -150^\circ = -180^\circ + 30^\circ$

e) $\frac{7\pi}{3} = 7 \cdot \frac{\pi}{3} = 7 \cdot 60^\circ = 360^\circ + 60^\circ \Rightarrow 60^\circ$

f) $13\pi \Rightarrow \pi = 180^\circ$

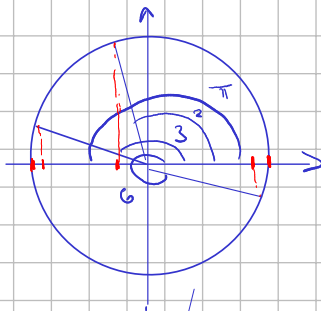
Exercise 15

a)



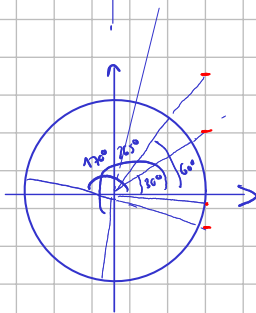
$$\sin(272^\circ) < \sin(345^\circ) < \sin(180^\circ) < \sin(12^\circ) < \sin(60^\circ)$$

b)



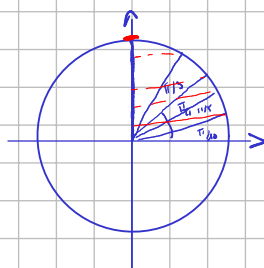
$$\cos(\pi) < \cos(3) < \cos(2) < \cos(6) < \cos(0)$$

c)



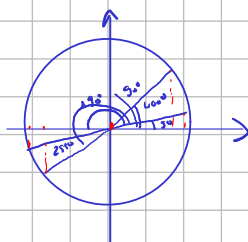
$$\tan(170^\circ) < \tan(358^\circ) < \tan(30^\circ) < \tan(60^\circ) < \tan(265^\circ)$$

d)



$$\sin\left(\frac{\pi}{10}\right) < \sin\left(\frac{\pi}{5}\right) < \sin\left(\frac{\pi}{11}\right) < \sin\left(\frac{\pi}{3}\right) < \sin\left(\frac{\pi}{2}\right)$$

e)



$$\cos(190^\circ) < \cos(255^\circ) < \cos(90^\circ) < \cos(400^\circ) < \cos(5^\circ)$$

Exercise 16

a) $\sin(30^\circ) = \sin(330^\circ)$

$\text{faux } \sin(330^\circ) = -\sin(30^\circ)$

b) $\cos(150^\circ) = \cos(210^\circ)$ vrai

c) $\tan(x) = \tan(x+\pi)$ vrai

d) $\cos(0) = -\cos(2\pi)$

$\text{faux } \cos(0) = \cos(2\pi)$

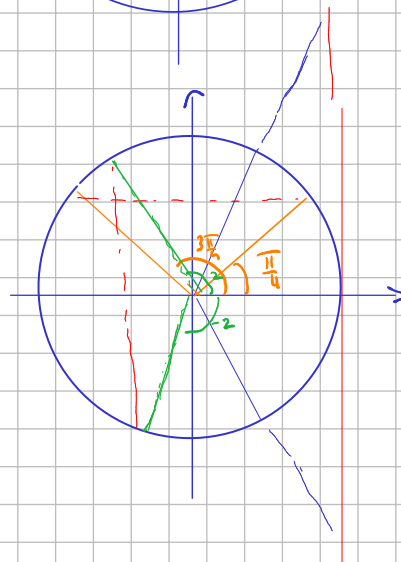
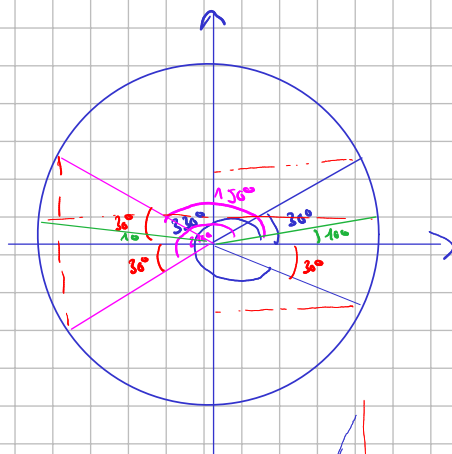
e) $\sin(170^\circ) = \sin(10^\circ)$ vrai

f) $\tan(70^\circ) = \tan(-70^\circ)$

$\text{faux } \tan(70^\circ) = -\tan(-70^\circ)$

g) $\sin\left(\frac{\pi}{4}\right) = \sin\left(\frac{3\pi}{4}\right)$ vrai

h) $\cos(2) = \cos(-2)$ vrai



Exercise 17

a) $\sin\left(-\frac{\pi}{3}\right) = -\sin\left(\frac{\pi}{3}\right) = -0,866$

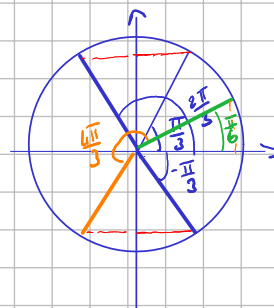
b) $\sin\left(\frac{\pi}{3} + 2\pi\right) = \sin\left(\frac{\pi}{3}\right) = 0,866$

c) $\sin\left(\frac{2\pi}{3}\right) = \sin\left(\frac{\pi}{3}\right) = 0,866$

d) $\sin\left(\frac{4\pi}{3}\right) = \sin\left(-\frac{\pi}{3}\right) = -0,866$

e) $\sin\left(2\pi - \frac{\pi}{3}\right) = \sin\left(-\frac{\pi}{3}\right) = -0,866$

f) $\cos\left(\frac{\pi}{6}\right) = 0,866$



Exercise 18

a) $\sin(\alpha) = 0,7 \Rightarrow \alpha_1 = \sin^{-1}(0,7) = 44,43^\circ \pm 360^\circ$

$\alpha_2 = 180^\circ - 44,43^\circ = 135,57^\circ \pm 360^\circ$

$-315,57^\circ; -224,43^\circ; 44,43^\circ; 135,57^\circ; 404,43^\circ; 495,57^\circ$

