

Correction exercices : Trigonométrie dans le cercle

Chapitre 10

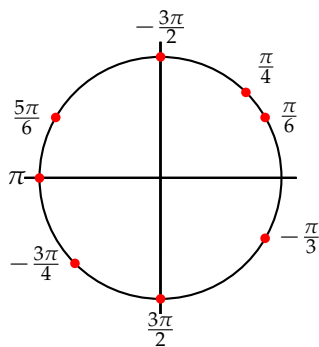
EXERCICE 1

degré	10	59	180	18	72	112,5
radian	$\frac{\pi}{18}$	$\frac{59\pi}{180}$	π	$\frac{\pi}{10}$	$\frac{2\pi}{5}$	$\frac{5\pi}{8}$

EXERCICE 2

radian	$\frac{\pi}{3}$	$\frac{2\pi}{3}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{8}$	$\frac{5\pi}{12}$	$\frac{3\pi}{2}$
degré	60	120	180	225	67,5	75	270

EXERCICE 3



EXERCICE 4

m.p. : mesure principale

angle	$\frac{7\pi}{3}$	-5π	$\frac{3\pi}{2}$	$\frac{13\pi}{4}$	$-\frac{7\pi}{6}$	$\frac{14\pi}{3}$
m.p.	$\frac{\pi}{3}$	π	$-\frac{\pi}{2}$	$-\frac{3\pi}{4}$	$\frac{5\pi}{6}$	$\frac{2\pi}{3}$

angle	210°	-330°
m.p.	-150°	30°

EXERCICE 5

a) $\cos^2 x = 1 - \sin^2 x = \frac{5}{9}$ et $\cos x > 0$

donc $\cos x = \frac{\sqrt{5}}{3}$

b) $\sin^2 x = 1 - \cos^2 x = \frac{24}{25}$ et $\sin x < 0$

donc $\sin x = -\frac{2\sqrt{6}}{5}$

c) $\cos^2 x = 1 - \sin^2 x = \frac{4}{9}$ et $\cos x < 0$

donc $\cos x = -\frac{2}{3}$

d) $\tan^2 x = \frac{1}{\cos^2 x} - 1 = \frac{5}{4}$ et $\tan x < 0$

donc $\tan x = -\frac{\sqrt{5}}{2}$

EXERCICE 6

a) $A = (\cos x + \sin x)^2 + (\cos x - \sin x)^2$

$$A = \cos^2 x + 2 \cos x \sin x + \sin^2 x + \cos^2 x - 2 \cos x \sin x + \sin^2 x = 2$$

b) $B = (\cos x + \sin x)^2 - (\cos x - \sin x)^2$

$$B = \cos^2 x + 2 \cos x \sin x + \sin^2 x - \cos^2 x + 2 \cos x \sin x - \sin^2 x = 4 \cos x \sin x$$

EXERCICE 7

a) $\sin^2 \frac{\pi}{5} = 1 - \cos^2 \frac{\pi}{5} = \frac{10 - 2\sqrt{5}}{16}$

or $\sin \frac{\pi}{5} > 0$ donc $\sin \frac{\pi}{5} = \frac{\sqrt{10 - 2\sqrt{5}}}{4}$

b) $\sin \frac{4\pi}{5} = \sin \left(\pi - \frac{\pi}{5} \right) = \sin \frac{\pi}{5} = \frac{\sqrt{10 - 2\sqrt{5}}}{4}$

$$\sin \frac{9\pi}{5} = \sin \left(-\frac{\pi}{5} \right) = -\sin \frac{\pi}{5} = -\frac{\sqrt{10 - 2\sqrt{5}}}{4}$$

$$\cos \frac{4\pi}{5} = \cos \left(\pi - \frac{\pi}{5} \right) = -\cos \frac{\pi}{5} = \frac{-1 - \sqrt{5}}{4}$$

$$\cos \frac{9\pi}{5} = \cos \left(-\frac{\pi}{5} \right) = \cos \frac{\pi}{5} = \frac{1 + \sqrt{5}}{4}$$

EXERCICE 8

a) $A = -\sin x + \cos x$

b) $B = -\sin x + \sin x = 0$

c) $C = -\cos x - \cos x = -2 \cos x$

d) $D = \cos x + 3 \sin x - 4 \sin x = \cos x - \sin x$

EXERCICE 9

a) $\sin^2 \frac{\pi}{12} = 1 - \cos^2 \frac{\pi}{12} = \frac{8 - 2\sqrt{3}}{16}$
 or $\sin \frac{\pi}{12} > 0$ donc $\sin \frac{\pi}{5} = \frac{\sqrt{2} - \sqrt{6}}{4}$

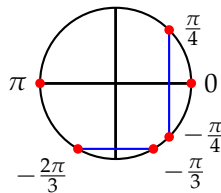
b) $\cos \frac{11\pi}{12} = \cos \left(\pi - \frac{\pi}{12} \right) = -\cos \frac{\pi}{12}$
 $= \frac{-\sqrt{2} - \sqrt{6}}{4}$
 $\sin \frac{11\pi}{12} = \sin \left(\pi - \frac{\pi}{12} \right) = \sin \frac{\pi}{12}$
 $= \frac{\sqrt{2} - \sqrt{6}}{4}$

EXERCICE 10

- a) $-\frac{\sqrt{3}}{2}$ b) $-\frac{\sqrt{3}}{2}$ c) -1
 d) $\frac{\sqrt{3}}{2}$ e) $\frac{\sqrt{2}}{2}$ f) $\frac{1}{2}$
 g) $-\frac{\sqrt{2}}{2}$ h) $\frac{\sqrt{3}}{3}$

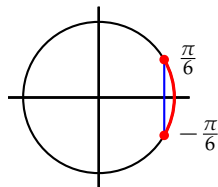
EXERCICE 11

- a) $x = \pm \frac{\pi}{4}$
 b) $x = 0$ ou $x = \pi$
 c) $x = -\frac{\pi}{3}$ ou
 $x = -\frac{2\pi}{3}$

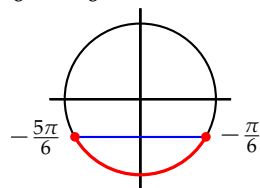


EXERCICE 12

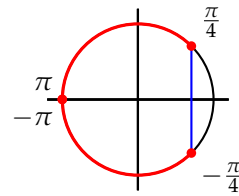
a) $S = \left[-\frac{\pi}{6}; \frac{\pi}{6} \right]$



b) $S = \left] -\frac{5\pi}{6}; -\frac{\pi}{6} \right[$

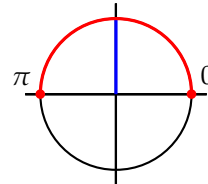


c) $S = \left] -\pi; -\frac{\pi}{4} \right] \cup \left[\frac{\pi}{4}; \pi \right]$

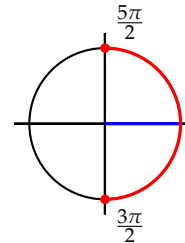


EXERCICE 13

a) Vrai



b) Vrai



c) Faux $\frac{5\pi}{6} \geq \frac{2\pi}{3}$ mais $\sin \frac{5\pi}{6} \leq \sin \frac{2\pi}{3}$

d) Faux $\frac{\pi}{3} \geq \frac{\pi}{6}$ mais $\cos \frac{\pi}{3} \leq \cos \frac{\pi}{6}$