

CORRIGE – NOTRE DAME DE LA MERCI – MONTPELLIER

EXERCICE 1A.1

A ($\pi \text{ rad} = 180^\circ$)

B ($\frac{\pi}{12} \text{ rad} = \frac{180}{12} = 15^\circ$)

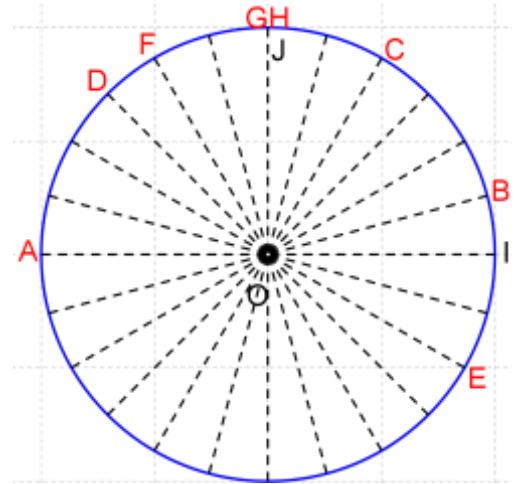
C ($\frac{\pi}{3} \text{ rad} = \frac{180}{3} = 60^\circ$)

D ($\frac{3\pi}{4} \text{ rad} = \frac{3 \times 180}{4} = 135^\circ$)

E ($\frac{-\pi}{6} \text{ rad} = \frac{-180}{6} = -30^\circ$)

F ($\frac{2\pi}{3} \text{ rad} = \frac{2 \times 180}{3} = 120^\circ$)

G ($\frac{\pi}{2} \text{ rad} = \frac{180}{2} = 90^\circ$)



EXERCICE 1A.2

Trouver des mesures équivalentes « à un certain nombre de tours près :

A ($5\pi = \pi + 2 \times 2\pi$)

B ($\frac{-5\pi}{2} = \frac{-\pi}{2} - \frac{4\pi}{2} = \frac{-\pi}{2} - 2\pi$)

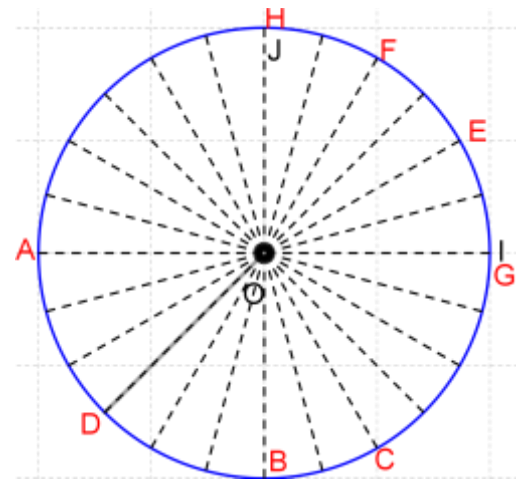
C ($\frac{11\pi}{3} = \frac{5\pi}{3} + \frac{6\pi}{3} = \frac{5\pi}{3} + 2\pi$)

D ($\frac{-11\pi}{4} = \frac{-3\pi}{4} - \frac{8\pi}{4} = \frac{-3\pi}{4} - 2\pi$)

E ($\frac{13\pi}{6} = \frac{\pi}{6} + \frac{12\pi}{6} = \frac{\pi}{6} + 2\pi$)

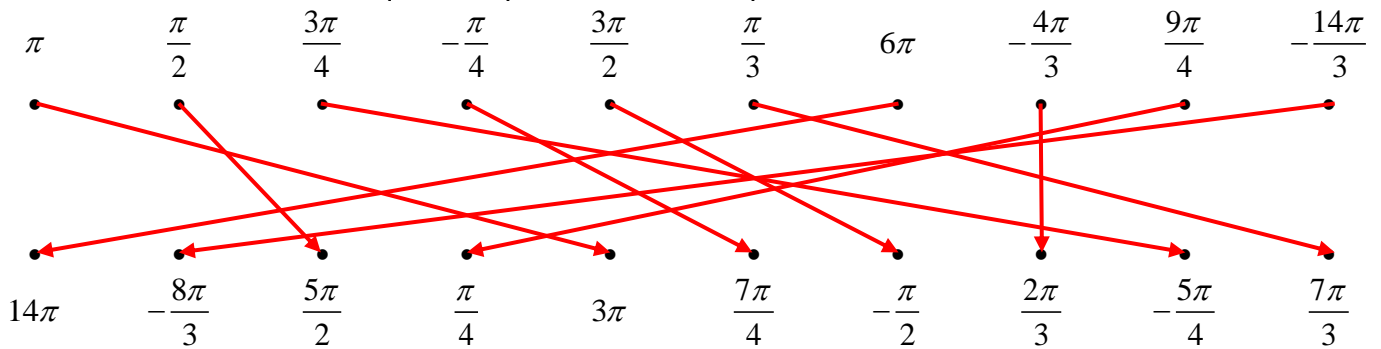
F ($\frac{-5\pi}{3} = \frac{\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3} - 2\pi$)

G ($-534\pi = 0 - 267 \times 2\pi$)



EXERCICE 1A.3

Associer entre eux les nombres qui correspondent au même point du cercle :



Egalités à 2π près

$3\pi = \pi + 2\pi$

$\frac{5\pi}{2} = \frac{\pi}{2} + \frac{4\pi}{2} = \frac{\pi}{2} + 2\pi$

$-\frac{5\pi}{4} + 2\pi = -\frac{5\pi}{4} + \frac{8\pi}{4} = \frac{3\pi}{4}$

$\frac{7\pi}{4} - 2\pi = \frac{7\pi}{4} - \frac{8\pi}{4} = -\frac{\pi}{4}$

$\frac{3\pi}{2} - 2\pi = \frac{3\pi}{2} - \frac{4\pi}{2} = -\frac{\pi}{2}$

$\frac{\pi}{3} + 2\pi = \frac{\pi}{3} + \frac{6\pi}{3} = \frac{7\pi}{3}$

$6\pi + 8\pi = 6\pi + 4 \times 2\pi = 14\pi$

$-\frac{4\pi}{3} + 2\pi = -\frac{4\pi}{3} + \frac{6\pi}{3} = \frac{2\pi}{3}$

$\frac{9\pi}{4} - 2\pi = \frac{9\pi}{4} - \frac{8\pi}{4} = \frac{\pi}{4}$

$-\frac{14\pi}{3} + 2\pi = -\frac{14\pi}{3} + \frac{6\pi}{3} = -\frac{8\pi}{3}$

EXERCICE 1A.4

Retrouver 4 autres longueurs d'arcs (2 positives, 2 négatives) correspondant au même point.

$$\frac{3\pi}{2} \pm k \times 2\pi = \frac{3\pi}{2} \pm k \times \frac{4\pi}{2}, k \in \mathbb{Z}$$

$$-\frac{\pi}{4} \pm k \times 2\pi = -\frac{\pi}{4} \pm k \times \frac{8\pi}{4}, k \in \mathbb{Z}$$

$$\frac{2\pi}{3} \pm k \times 2\pi = \frac{2\pi}{3} \pm k \times \frac{6\pi}{3}, k \in \mathbb{Z}$$

$$-\frac{5\pi}{12} \pm k \times 2\pi = -\frac{5\pi}{12} \pm k \times \frac{24\pi}{12}, k \in \mathbb{Z}$$

| | |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| a. $\frac{3\pi}{2} \rightarrow \frac{7\pi}{2}; \frac{11\pi}{2}; -\frac{\pi}{2}; -\frac{5\pi}{2}$ | b. $-\frac{\pi}{4} \rightarrow \frac{7\pi}{4}; \frac{15\pi}{4}; -\frac{9\pi}{4}; -\frac{17\pi}{4}$ |
| c. $\frac{2\pi}{3} \rightarrow \frac{8\pi}{3}; \frac{14\pi}{3}; -\frac{4\pi}{3}; -\frac{10\pi}{3}$ | d. $-\frac{5\pi}{12} \rightarrow \frac{19\pi}{12}; \frac{43\pi}{12}; -\frac{29\pi}{12}; -\frac{53\pi}{12}$ |

EXERCICE 1A.5

a. A l'aide du tableau, retrouver la longueur de l'arc associé à l'angle (en degré)

→ produits en croix : on pose x l'angle cherché

| Degrés | 180 | 15 | 30 | 90 | 135 | 150 |
|-------------------------------|-------|----------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Longueur de l'arc (en radian) | π | $180 \times x = 15 \times \pi$ $x = \frac{15\pi}{180} = \frac{\pi}{12}$ | $180 \times x = 30 \times \pi$ $x = \frac{30\pi}{180} = \frac{\pi}{6}$ | $\frac{\pi}{2}$ | $180 \times x = 135 \times \pi$ $x = \frac{135\pi}{180} = \frac{3\pi}{4}$ | $180 \times x = 150 \times \pi$ $x = \frac{50\pi}{180} = \frac{5\pi}{6}$ |

b. A l'aide du tableau, retrouver l'angle (en degrés) associé à l'arc

→ produits en croix

| Longueur de l'arc | π | $\frac{5\pi}{12}$ | $\frac{5\pi}{6}$ | $\frac{2\pi}{3}$ | $\frac{9\pi}{4}$ | $\frac{5\pi}{2}$ |
|-------------------|-------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Degrés | 180 | $\pi \times x = 180 \times \frac{5\pi}{12}$ $x = 180 \times \frac{5\pi}{12} \times \frac{1}{\pi}$ $= 75^\circ$ | $\pi \times x = 180 \times \frac{5\pi}{6}$ $x = 180 \times \frac{5\pi}{6} \times \frac{1}{\pi}$ $= 150^\circ$ | $\pi \times x = 180 \times \frac{2\pi}{3}$ $x = 180 \times \frac{2\pi}{3} \times \frac{1}{\pi}$ $= 120^\circ$ | $\pi \times x = 180 \times \frac{9\pi}{4}$ $x = 180 \times \frac{9\pi}{4} \times \frac{1}{\pi}$ $= 405^\circ$ | $\pi \times x = 180 \times \frac{5\pi}{2}$ $x = 180 \times \frac{5\pi}{2} \times \frac{1}{\pi}$ $= 450^\circ$ |