

Sujet 1

Exercice 2

4 points

$$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2} \quad \sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2} \quad \cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2} \quad \sin(\pi) = 0$$

Exercice 3

4 points

$$\cos\left(\frac{-\pi}{3}\right) = \frac{1}{2} \quad \sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2} \quad \cos\left(\frac{3\pi}{2}\right) = 0 \quad \sin(5\pi) = 0$$

Exercice 4

5 points

$$\cos(-x) = \cos(x) \quad \sin\left(x - \frac{\pi}{2}\right) = \cos(x) \quad \sin(x + \pi) = -\sin(x) \quad \cos(\pi - x) = -\cos(x)$$

Sujet 2

Exercice 2

4 points

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Exercice 3

4 points

$$\cos\left(\frac{-\pi}{3}\right) = \frac{1}{2} \quad \sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2} \quad \cos\left(\frac{3\pi}{2}\right) = 0 \quad \sin(5\pi) = 0$$

Exercice 4

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$$\cos(-x) = \cos(x) \quad \sin\left(x - \frac{\pi}{2}\right) = -\cos(x) \quad \sin(x + \pi) = -\sin(x) \quad \cos(\pi - x) = -\cos(x)$$

Sujet 3

Exercice 2

4 points

$$\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2} \quad \cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2} \quad \sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2} \quad \sin(\pi) = 0$$

Exercice 3

4 points

$$\sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2} \quad \cos\left(\frac{3\pi}{2}\right) = 0 \quad \sin(5\pi) = 0 \quad \cos\left(\frac{-\pi}{3}\right) = \frac{1}{2}$$

Exercice 4

5 points

$$\sin\left(x - \frac{\pi}{2}\right) = -\cos(x) \quad \sin(x + \pi) = -\sin(x) \quad \cos(\pi - x) = -\cos(x) \quad \cos(-x) = \cos(x)$$

Question 1

Si $\sin x = \frac{1}{4}$ alors $\sin(x - \pi) = \frac{1}{4}$ et $\sin(x + \pi) = -\frac{1}{4}$

Question 2

On sait que $\cos(t) = \frac{2}{5}$, donc $\cos(t + 4\pi) = \cos(t) = \frac{2}{5}$.

De plus, on a $\cos(-t) = \cos(t) = \frac{2}{5}$ car cos est une fonction paire.

Ainsi, on a $\cos(t + 4\pi) + \cos(-t) = \frac{2}{5} + \frac{2}{5} = \frac{4}{5}$.

Question 3

On peut utiliser l'identité trigonométrique $\sin(\pi - x) = \sin x$ et $\cos\left(x + \frac{\pi}{2}\right) = -\sin x$ pour simplifier l'expression :

$$\begin{aligned}\sin(\pi - x) + \cos\left(x + \frac{\pi}{2}\right) &= \sin x + \cos\left(x + \frac{\pi}{2}\right) \\ &= \sin x - \sin x \\ &= 0\end{aligned}$$

Ainsi, l'expression $\sin(\pi - x) + \cos\left(x + \frac{\pi}{2}\right)$ est égale à 0.

Question 4

On peut utiliser l'identité trigonométrique $\sin(x + \pi) = -\sin(x)$ pour simplifier l'équation :

$$\begin{aligned}2 \sin(x + \pi) + 1 &= 0 \\ 2(-\sin x) + 1 &= 0 \\ \sin x &= \frac{1}{2}\end{aligned}$$

La solution dans l'intervalle $\left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$ est donc $x = \frac{\pi}{6}$.

Ainsi, l'unique solution de l'équation $2 \sin(x + \pi) + 1 = 0$ dans l'intervalle $\left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$ est $x = \frac{\pi}{6}$.