

1. Soit $x \in \mathbb{R}$, On a

$$-4 \sin(x) \cos(x) \geq 1$$

$$\Leftrightarrow -2 \sin(2x) \geq 1 \quad \checkmark$$

$$\Leftrightarrow \sin(2x) \leq -\frac{1}{2} \quad \checkmark$$

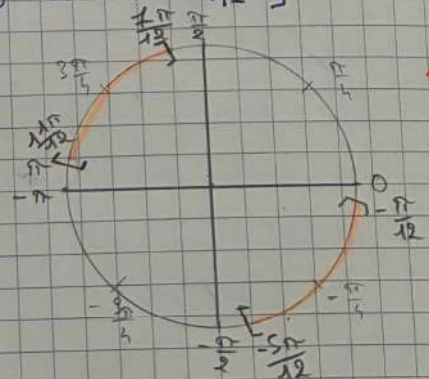
Sketch

$$\Leftrightarrow \begin{cases} 2x \geq \frac{7\pi}{6} + \dots \\ 2x \leq \frac{11\pi}{6} + \dots \end{cases} \Leftrightarrow \begin{cases} x \geq \frac{7\pi}{12} + \dots \\ x \leq \frac{11\pi}{12} + \dots \end{cases}$$

Parachutage

On sur $\mathbb{R}$ on a pour solutions : $x \in \left[\frac{7\pi}{12} + k\pi, \frac{11\pi}{12} + k\pi \right] (k \in \mathbb{Z})$

Donc sur $[-\pi; \pi]$ On a $x \in \left[-\frac{5\pi}{12}, -\frac{\pi}{12} \right] \cup \left[\frac{7\pi}{12}, \frac{11\pi}{12} \right]$



Bien

2. Soit $x \in \mathbb{R}$. On a

$$-4 \sin(x) \cos(x) \leq 2 - 2 \cos(2x)$$

$$\Leftrightarrow -4 \sin(x) \cos(x) \leq 4 \sin^2(x) \quad \checkmark$$

$$\Leftrightarrow 0 \leq \sin^2(x) + \sin(x) \cos(x) \quad \checkmark$$

$$\Leftrightarrow 0 \leq \sin(x) [\sin(x) + \cos(x)] \quad \checkmark$$

$$\Leftrightarrow \begin{cases} \sin(x) \geq 0 \text{ et } \sin(x) + \cos(x) \geq 0 \\ \text{ou} \\ \sin(x) \leq 0 \text{ et } \sin(x) + \cos(x) \leq 0 \end{cases} \quad \text{OK}$$

Sketch...

$$\Rightarrow \begin{cases} 0 \leq x \leq \frac{3\pi}{4} \\ \text{ou} \\ -\pi \leq x \leq -\frac{\pi}{4} \end{cases} \quad \text{Non justifié}$$

S = ...

Alors $x \in [k\pi, k\pi + \frac{3\pi}{4}] (k \in \mathbb{Z})$.

Donc sur $[-\pi; \pi]$ $x \in \left[-\pi, -\frac{\pi}{4} \right] \cup \left[0, \frac{3\pi}{4} \right] \cup \{\pi\}$.

