

Fachname

B.

Thema

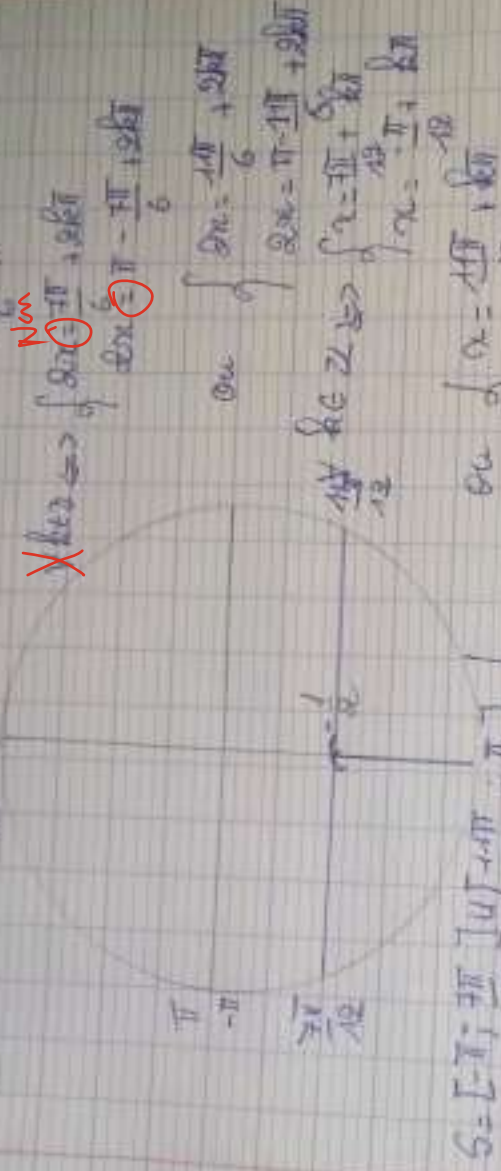
Satz $x \in \dots$

1. $-\cos(x) \cos(2x) \geq 1$

$\Leftrightarrow -2 \sin(x) \geq 1$ ✓

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

$\Leftrightarrow \sin(2x) \leq -\frac{1}{2}$ ou $\sin(2x) \leq \sin(\frac{7\pi}{6})$



$S = [\frac{7\pi}{12}; \frac{11\pi}{12}] \cup [\frac{19\pi}{12}; \frac{23\pi}{12}]$

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

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

$\Leftrightarrow -2 \sin(2x) + 2 \cos(2x) \leq 2$ ✓

$\Leftrightarrow \sin(2x) + 1 - \sin^2(2x) \leq 1$

$\Leftrightarrow \sin^3(2x) - \sin(2x) \geq 0$

on pose $X = \sin(2x)$

$X^2 - X \geq 0$

on a $X \leq 0$ ou $X \geq 1$

Retour à la variable $\sin(2x)$

$\sin(2x) \leq 0$ ou $\sin(2x) \geq 1$

$\Leftrightarrow \sin(2x) \leq \sin(0)$ ou $\sin(2x) \geq \sin(\frac{\pi}{2})$

ou $\{2x = \pi + 2k\pi\} \Leftrightarrow \{x = k\pi\}$

ou $\{2x = 2k\pi\} \Leftrightarrow \{x = k\pi\}$

$\forall k \in \mathbb{Z}$

Non

$\Leftrightarrow \sin(2x) \leq \sin(\frac{7\pi}{6})$

$\Leftrightarrow 2x \in [\frac{7\pi}{6}; \frac{11\pi}{6}] + 2k\pi$

ou $\{2x = \frac{11\pi}{6} + 2k\pi\}$

$\Leftrightarrow 2x = \pi - \frac{11\pi}{6} + 2k\pi$

$\Leftrightarrow x = \frac{5\pi}{12} + k\pi$

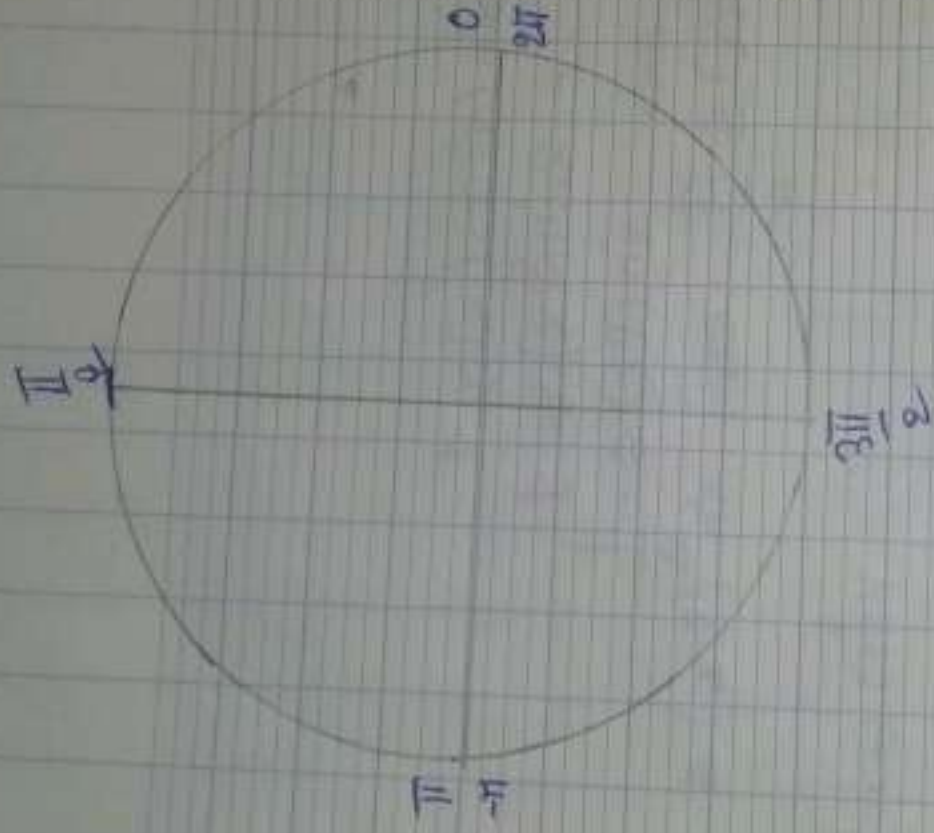
$\Leftrightarrow x = \frac{11\pi}{12} + k\pi$

$\Leftrightarrow x = -\frac{5\pi}{12} + k\pi$

Sat

Pour tout $x \in \mathbb{R}$

Non.



$$S = [-\pi; \pi] \cup \left[\frac{\pi}{2}; \frac{3\pi}{2}\right]$$