29.04.25

4.3.5 Résoudre les équations suivantes.

a) $4\cos^2(t) - 4\cos(t) - 3 = 0$

b) $2\sin^2(x) - 3\sin(x) + 1 = 0$

c) $3\sin^2(z) + 8\cos(z) + 1 = 0$

d) $3\sin^2(t) + \cos^2(t) - 2 = 0$

$\boxed{\sin^2(\alpha) + \cos^2(\alpha) = 1}$ pg 32

$\boxed{x^2 = 16 \Rightarrow x = \pm 4}$

$3\sin^2(t) + (1 - \sin^2(t)) - 2 = 0$

(*) $2\sin^2(t) - 1 = 0$

Posons $x = \sin(t)$: $-1 \leq x \leq 1$

Mon (*) devient : $2x^2 - 1 = 0$

$2x^2 = 1$

$x^2 = \frac{1}{2} \Rightarrow x = \pm\sqrt{\frac{1}{2}} = \pm\frac{\sqrt{1}}{\sqrt{2}} = \pm\frac{1}{\sqrt{2}} = \pm\frac{\sqrt{2}}{2}$

Valeurs exactes des fonctions trigonométriques d'angles particuliers

α (radians)	α (degrés)	$\cos(\alpha)$	$\sin(\alpha)$	$\tan(\alpha)$
0	0	1	0	0
$\frac{\pi}{6}$	30	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{3}$
$\frac{\pi}{4}$	45	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
$\frac{\pi}{3}$	60	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$
$\frac{\pi}{2}$	90	0	1	–

1°) $\sin(t) = \frac{\sqrt{2}}{2} \overset{\text{TI}}{\Rightarrow} t = 45°$

Formulaire

$t = \begin{cases} 45° + k \cdot 360° \\ 135° + k \cdot 360° \end{cases}, \; k \in \mathbb{Z}$

2°) $\sin(t) = -\frac{\sqrt{2}}{2} \overset{\text{TI}}{\Rightarrow} t = -45°$

$t = \begin{cases} -45° + k \cdot 360° \\ 225° + k \cdot 360° \end{cases}, \; k \in \mathbb{Z}$

e) $5\sin(x) = 6\cos^2(x)$

$\sin^2(\alpha) + \cos^2(\alpha) = 1$

$$6\cos^2(x) - 5\sin(x) = 0$$

$$6\left(1 - \sin^2(x)\right) - 5\sin(x) = 0$$

$$6 - 6\sin^2(x) - 5\sin(x) = 0$$

$$6\sin^2(x) + 5\sin(x) - 6 = 0$$

Posons $y = \sin(x)$, $-1 \leq y \leq 1$

$$6y^2 + 5y - 6 = 0$$

$$\Delta = 25 + 144 = 169 = 13^2$$

$$y = \frac{-5 \pm 13}{12} = \begin{cases} -18/12 = -3/2 \Rightarrow \sin(x) = -\frac{3}{2} \Rightarrow \text{impossible} \\ 8/12 = 2/3 \Rightarrow \sin(x) = \frac{2}{3} \overset{TI}{\Rightarrow} x \cong 41,81^\circ \end{cases}$$

$\boxed{2nd}$ $\overset{\sin^{-1}}{\boxed{\sin}}$

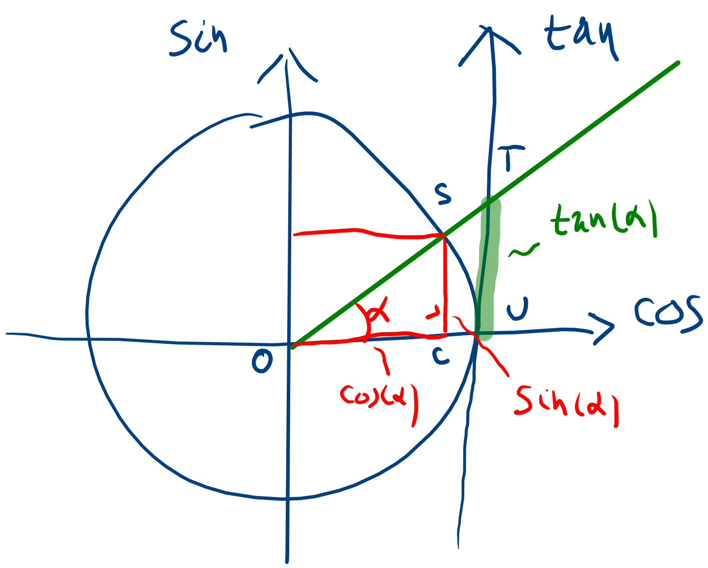
$$x \cong \begin{cases} 41,81^\circ + k \cdot 360^\circ \\ 138,19^\circ + k \cdot 360^\circ \end{cases} , k \in \mathbb{Z}$$

f) $\cos(x) = \tan(x)$

g) $8\cos^2(t) + 5\sin(t) - 1 = 0$

h) $\tan^4(t) - 4\tan^2(t) + 3 = 0$

f) $\cos(x) = \dfrac{\sin(x)}{\cos(x)} \Rightarrow \cos^2(x) = \sin(x)$



$\dfrac{\tan(\alpha)}{1} = \dfrac{\sin(\alpha)}{\cos(\alpha)}$

par la similitude des Δ: $\Delta OCS \sim \Delta OUT$