EXAM : TRIGONOMETRIC EQUATIONS

✨ Trigonometric Equations – Level 1

- Solve: $\sin(x) = \frac{1}{2}$
- Solve: $\sin(x) = -1$
- Solve: $\cos(x) = 0$
- Solve: $\cos(x) = \frac{\sqrt{3}}{2}$
- Solve: $\tan(x) = 1$
- Solve: $\tan(x) = -1$

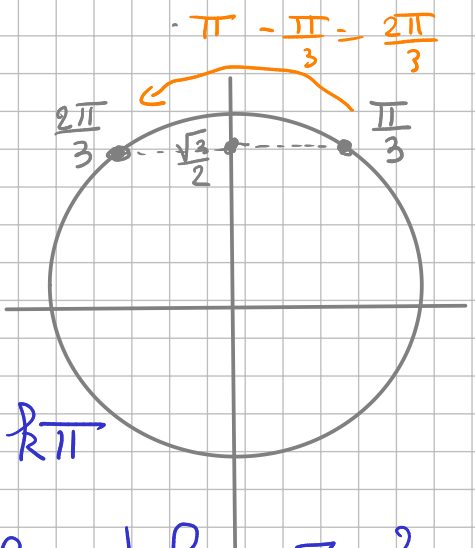
🚀 Trigonometric Equations – Level 2

- Solve: $\sin(2x) = \sqrt{3}/2$
- Solve: $2\sin^2(x) - 1 = 0$
- Solve: $\cos(2x) = -1$
- Solve: $\cos(x) = -\frac{1}{2}$
- Solve: $\tan(x - \frac{\pi}{4}) = \sqrt{3}$
- Solve: $\tan^2(x) = 3$

🧠 Trigonometric Equations – Level 3 (Isolation + Shift/Multiple)

- Solve: $2\sin(2x) + 1 = 0$
- Solve: $3 - 4\sin\left(x - \frac{\pi}{3}\right) = 1$
- Solve: $\cos(3x) - 1 = 0$
- Solve: $2\cos\left(x + \frac{\pi}{4}\right) - \sqrt{3} = 0$
- Solve: $3\tan(2x) + \sqrt{3} = 0$
- Solve: $\sqrt{3} - tan\left(x - \frac{\pi}{6}\right) = 0$

$$\sin(2x) = \frac{\sqrt{3}}{2}$$



$2x = \frac{\pi}{3} + 2k\pi$ ou $2x = \frac{2\pi}{3} + 2k\pi$

$\Rightarrow x = \frac{\pi}{6} + k\pi$ ou $x = \frac{\pi}{3} + k\pi$

$sol = \left\{ \frac{\pi}{6} + k\pi ; \frac{\pi}{3} + k\pi \mid k \in \mathbb{Z} \right\}$

$x^2 = 4$
$x = 2$ ou $x = -2$

Solve: $2\sin^2(x) - 1 = 0$

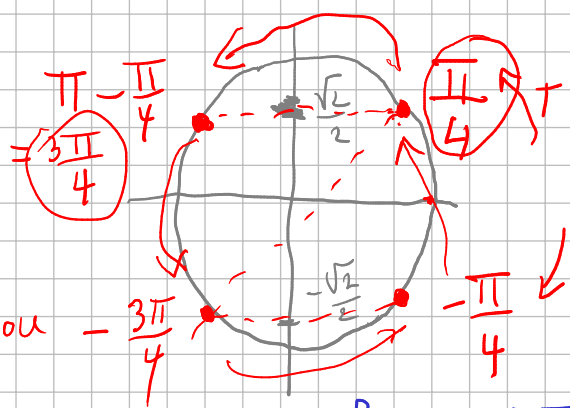
$2 \cdot \sin^2 x = 1$

$\sin^2 x = \frac{1}{2}$

$\sin x = \sqrt{\frac{1}{2}}$ ou $\sin x = -\sqrt{\frac{1}{2}}$

$\sqrt{\frac{1}{2}} = \frac{\sqrt{1}}{\sqrt{2}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\sin x = \frac{\sqrt{2}}{2}$ ou $\sin x = -\frac{\sqrt{2}}{2}$



$\pi - \left(-\frac{\pi}{4}\right)$

$\frac{5\pi}{4}$ ou $-\frac{3\pi}{4}$

$\frac{\sqrt{2}}{2} \approx 0{,}7$

$\arcsin \frac{\sqrt{2}}{2} =$

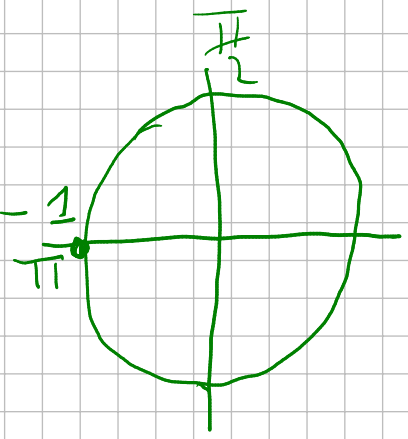
$Sol = \left\{ \frac{\pi}{4} + 2k\pi ; \frac{3\pi}{4} + 2k\pi ; \right.$

~~$\frac{\pi}{4} = 2k$~~ 9/10 $-\frac{3\pi}{4} + 2k\pi$, $-\frac{\pi}{4} + 2k\pi$

$| k \in \mathbb{Z} \}$.

10/10 $Sol = \{ \frac{\pi}{4} + k \cdot \frac{\pi}{2} | k \in \mathbb{Z} \}$

$\cos(2x) = -1$ $\quad \frac{2k\pi}{2}$

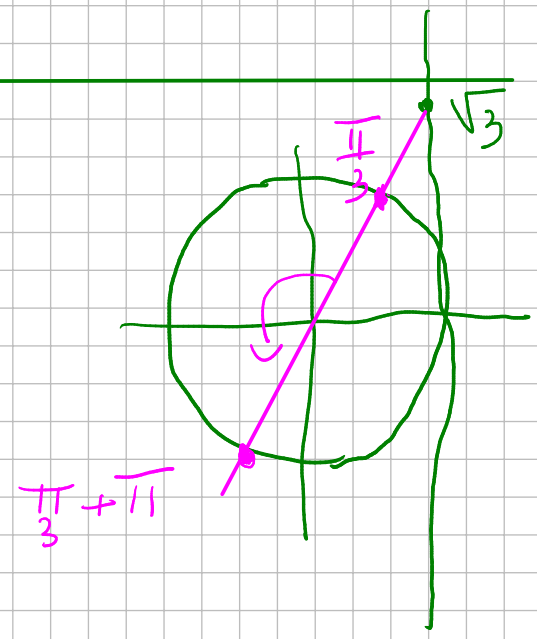


$2x = \pi + 2k\pi$

$x = \frac{\pi}{2} + k\pi$

$Sol = \{ \frac{\pi}{2} + k\pi | k \in \mathbb{Z} \}$

$\tan(x - \frac{\pi}{4}) = \sqrt{3}$



$x - \frac{\pi}{4} = \frac{\pi}{3} + k\pi$

$x = \frac{\pi}{3} + \frac{\pi}{4} + k\pi$

$x = \frac{7\pi}{12} + k\pi$ $\quad Sol = \{ \frac{7\pi}{12} + k\pi | k \in \mathbb{Z} \}$

$$\tan^2 x = 3$$

$$\tan x = \sqrt{3} \quad \text{ou} \quad \tan x = -\sqrt{3}$$