

# EQUAZIONI OMOGENEE IN $\text{sen } x$ E $\text{cos } x$ .

1/3

- 1)  $a \text{sen } x + b \text{cos } x = 0$  1° grado.
  - 2)  $a \text{sen}^2 x + b \text{sen } x \text{cos } x + c \text{cos}^2 x = 0$  2° grado.
  - 3)  $a \text{sen}^3 x + b \text{sen}^2 x \text{cos } x + c \text{sen } x \text{cos}^2 x + d \text{cos}^3 x = 0$  3° grado.
- } OMOGENEE.

## ESEMPIO

$$\text{sen } x + \text{cos } x = 0$$

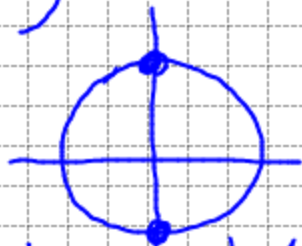
pongo  $\text{cos } x \neq 0 \quad x \neq \frac{\pi}{2} + k\pi \quad k \in \mathbb{N}$

divido per  $\text{cos } x$  e ottengo  $\text{tg } x + 1 = 0 \quad \text{tg } x = -1$

$$x = \frac{3\pi}{4} + k\pi \quad k \in \mathbb{N}$$

se  $x = \frac{\pi}{2} + k\pi \quad k \in \mathbb{N} \Rightarrow 1 + 0 = 0$  NO!  $\rightarrow x = \frac{\pi}{2}$   
 $x = \frac{3\pi}{2} \leftarrow -1 + 0 = 0$  NO!

$$S = \left\{ x \in \mathbb{R} \mid x = \frac{3\pi}{4} + k\pi; k \in \mathbb{N} \right\}$$

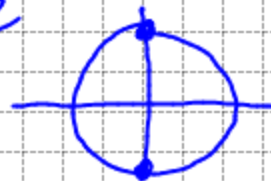


## ESEMPIO

$$\sin^2 x + (1 - \sqrt{3}) \sin x \cos x - \sqrt{3} \cos^2 x = 0$$

diviso per  $\cos^2 x$  e ho:

pongo  $\cos x \neq 0 \Rightarrow$   
 $x \neq \frac{\pi}{2} + k\pi \quad k \in \mathbb{N}$



$$\operatorname{tg}^2 x + (1 - \sqrt{3}) \operatorname{tg} x - \sqrt{3} = 0$$

$$\operatorname{tg} x_{1,2} = \frac{-1 + \sqrt{3} \pm \sqrt{1 + 3 - 2\sqrt{3} + 4\sqrt{3}}}{2} = \frac{-1 + \sqrt{3} \pm \sqrt{1 + 3 + 2\sqrt{3}}}{2} =$$

$$= \frac{-1 + \sqrt{3} \pm (1 + \sqrt{3})}{2} \rightarrow \frac{-1 + \sqrt{3} - 1 - \sqrt{3}}{2} = -1$$

$$\frac{-1 + \sqrt{3} + 1 + \sqrt{3}}{2} = \sqrt{3}$$

$$\operatorname{Tg} x = -1$$

$$x = \frac{3\pi}{4} + k\pi \quad k \in \mathbb{N}$$

$$\operatorname{Tg} x = \sqrt{3}$$

$$x = \frac{\pi}{3} + k\pi \quad k \in \mathbb{N}$$

se sostituisco nell'eq. di partenza  $x = \frac{\pi}{2} + k\pi \quad k \in \mathbb{N}$  ottengo sempre  $1 = 0$  NO!

## ESEMPIO

$$\sin x \cos^2 x - \sqrt{3} \sin^2 x \cos x = 0$$

$$\sin x \cos x (\cos x - \sqrt{3} \sin x) = 0$$

$$\sin x = 0$$

$$x = k\pi \quad k \in \mathbb{N}$$

$$\cos x = 0$$

$$x = \frac{\pi}{2} + k\pi \quad k \in \mathbb{N}$$

$$\cos x - \sqrt{3} \sin x = 0 \quad \operatorname{Tg} x = \frac{1}{\sqrt{3}}$$

$$x = \frac{\pi}{6} + k\pi, k \in \mathbb{N}$$

## EQUAZIONI RICONDUCIBILI ALLE OMOGENEE

$$a \sin^2 x + b \sin x \cos x + c \cos^2 x + d = 0 \quad (\sin^2 x + \cos^2 x)$$

moltiplico il termine noto per  $1 = \sin^2 x + \cos^2 x$

$$(a+d) \sin^2 x + b \sin x \cos x + (c+d) \cos^2 x = 0$$