ESEMPIO (OMOGENEE DI 2° GRADO)

$$\sqrt{3}\,\text{sen}^2 x + 2\,\text{sen}\,x\cos x - \sqrt{3}\cos^2 x \overset{\times 1}{-\sqrt{3}} = 0$$

la riconduco ad omogenea moltiplicando $-\sqrt{3}$ per $1 = \text{sen}^2 x + \cos^2 x$

$$\cancel{\sqrt{3}\,\text{sen}^2 x} + 2\,\text{sen}\,x\cos x - \sqrt{3}\cos^2 x - \cancel{\sqrt{3}\,\text{sen}^2 x} - \sqrt{3}\cos^2 x = 0$$

$$\cos x\left(2\,\text{sen}\,x - 2\sqrt{3}\cos x\right) = 0$$

$$\cos x = 0 \qquad \boxed{x = \frac{\pi}{2} + k\pi \quad k \in \mathbb{N}}$$

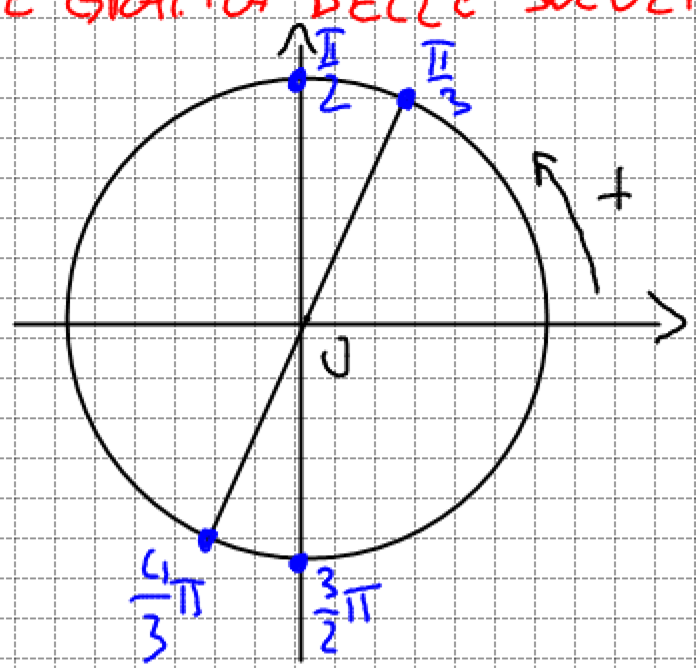
$$2\left(\text{sen}\,x - \sqrt{3}\cos x\right) = 0 \qquad \text{sen}\,x - \sqrt{3}\cos x = 0$$

pongo $\cos x \neq 0$ e divido per $\cos x$:

$$\text{tg}\,x - \sqrt{3} = 0 \qquad \text{tg}\,x = \sqrt{3} \qquad \boxed{x = \frac{\pi}{3} + k\pi \quad k \in \mathbb{N}}$$

se $\cos x = 0 \Rightarrow x = \frac{\pi}{2} + k\pi \quad k \in \mathbb{N} \Rightarrow \pm 1 = 0$ NO!

INTERPRETAZIONE GRAFICA DELLE SOLUZIONI



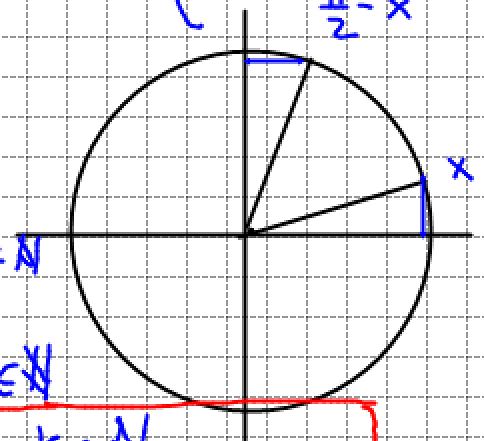
SISTEMI GONIOMETRICI

$$\begin{cases} x+y=\frac{\pi}{2} \\ \operatorname{sen} x+\cos y=1 \end{cases} \qquad \begin{cases} y=\frac{\pi}{2}-x \\ \operatorname{sen} x+\cos\left(\frac{\pi}{2}-x\right)=1 \end{cases} \qquad \begin{cases} y=\frac{\pi}{2}-x \\ \operatorname{sen} x+\underbrace{\operatorname{sen} x}_{\frac{\pi}{2}-x}=1 \end{cases}$$

$$\begin{cases} y=\frac{\pi}{2}-x \\ 2\operatorname{sen} x=1 \end{cases} \qquad \begin{cases} y=\frac{\pi}{2}-x \\ \operatorname{sen} x=\frac{1}{2} \end{cases}$$

$$\operatorname{sen} x=\frac{1}{2} \to x_1=\frac{\pi}{6}+2k\pi \quad k\in\mathbb{N}$$

$$\operatorname{sen} x=\frac{1}{2} \to x_2=\frac{5}{6}\pi+2k\pi \quad k\in\mathbb{N}$$



$$\begin{cases} x=\frac{\pi}{6}+2k\pi \quad k\in\mathbb{N} \\ y=\frac{\pi}{2}-\frac{\pi}{6}-2k\pi \quad k\in\mathbb{N} \end{cases} \Rightarrow \boxed{\begin{cases} x=\frac{\pi}{6}+2k\pi \quad k\in\mathbb{N} \\ y=\frac{1}{3}\pi-2k\pi \quad k\in\mathbb{N} \end{cases}}$$

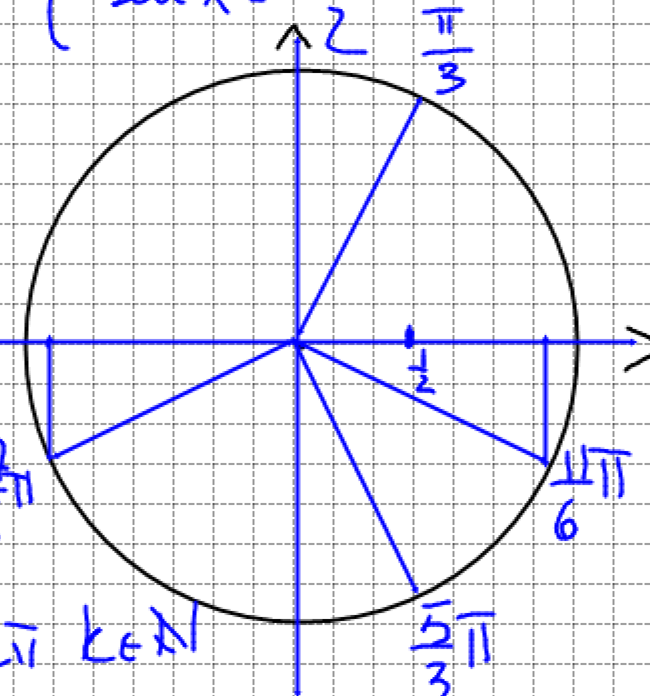
$$\begin{cases} x=\frac{5}{6}\pi+2k\pi \quad k\in\mathbb{N} \\ y=\frac{\pi}{2}-\frac{5}{6}\pi-2k\pi \quad k\in\mathbb{N} \end{cases} \Rightarrow \boxed{\begin{cases} x=\frac{5}{6}\pi+2k\pi \quad k\in\mathbb{N} \\ y=-\frac{1}{3}\pi-2k\pi \quad k\in\mathbb{N} \end{cases}}$$

SOLUZIONI

ESEMPIO

$$\begin{cases} \cos y - \text{sen}\, x = 1 \\ 4\,\text{sen}\, x \cos y + 1 = 0 \end{cases} \qquad \begin{cases} \cos y = 1 + \text{sen}\, x \\ 4\,\text{sen}\, x\,(1 + \text{sen}\, x) + 1 = 0 \end{cases} \qquad \begin{cases} \cos y = 1 + \text{sen}\, x \\ 4\,\text{sen}\, x + 4\,\text{sen}^2 x + 1 = 0 \end{cases}$$

$$\begin{cases} \cos y = 1 + \text{sen}\, x \\ (2\,\text{sen}\, x + 1)^2 = 0 \end{cases} \qquad \begin{cases} \cos y = 1 + \text{sen}\, x \\ 2\,\text{sen}\, x + 1 = 0 \end{cases} \qquad \begin{cases} \cos y = 1 + \text{sen}\, x \\ \text{sen}\, x = -\frac{1}{2} \end{cases}$$



$$\begin{cases} \cos y = 1 - \frac{1}{2} \\ x_2 = \frac{11}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ x_1 = \frac{7}{6}\pi + 2k\pi \quad k \in \mathbb{N} \end{cases} \qquad \begin{cases} \cos y = \frac{1}{2} \\ x_1 = \frac{7}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ x_2 = \frac{11}{6}\pi + 2k\pi \quad k \in \mathbb{N} \end{cases}$$

$$\begin{cases} y_1 = \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{N} \\ y_2 = \frac{5}{3}\pi + 2k\pi \quad k \in \mathbb{N} \\ x_1 = \frac{7}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ x_2 = \frac{11}{6}\pi + 2k\pi \quad k \in \mathbb{N} \end{cases}$$

$$* \begin{cases} x = \frac{7}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ y = \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{N} \end{cases}$$

$$* \begin{cases} x = \frac{7}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ y = \frac{5}{3}\pi + 2k\pi \quad k \in \mathbb{N} \end{cases}$$

* soluzioni

$$* \begin{cases} x = \frac{11}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ y = \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{N} \end{cases} \qquad * \begin{cases} x = \frac{11}{6}\pi + 2k\pi \quad k \in \mathbb{N} \\ y = \frac{5}{3}\pi + 2k\pi \quad k \in \mathbb{N} \end{cases}$$