

ESERCIZIO N° 151 PAG. 150

$$\sqrt{3} \operatorname{sen} \left(\frac{\pi}{5} - \frac{x}{2} \right) + \operatorname{sen} \left(\frac{3}{10} \pi + \frac{x}{2} \right) = 2 \quad \gamma \sim$$

$$\operatorname{sen} \left(\frac{\pi}{5} - \frac{x}{2} \right) = \cos \left(\frac{\pi}{2} - \frac{\pi}{5} + \frac{x}{2} \right) =$$

$$= \cos \left(\frac{3}{10} \pi + \frac{x}{2} \right)$$

$$\sqrt{3} \cos \left(\frac{3}{10} \pi + \frac{x}{2} \right) + \operatorname{sen} \left(\frac{3}{10} \pi + \frac{x}{2} \right) = 2 \quad \frac{3}{10} \pi + \frac{x}{2} = X$$

$$\sqrt{3+1} \left(\frac{\sqrt{3}}{2} \cos X + \frac{1}{2} \operatorname{sen} X \right) = 2$$

$$\frac{\sqrt{3}}{2} \cos X + \frac{1}{2} \operatorname{sen} X = 1$$

$$\operatorname{sen} \left(X + \frac{\pi}{3} \right) = 1$$

$$X + \frac{\pi}{3} = \frac{\pi}{2} + 2k\pi \quad \text{con } k \in \mathbb{N}$$

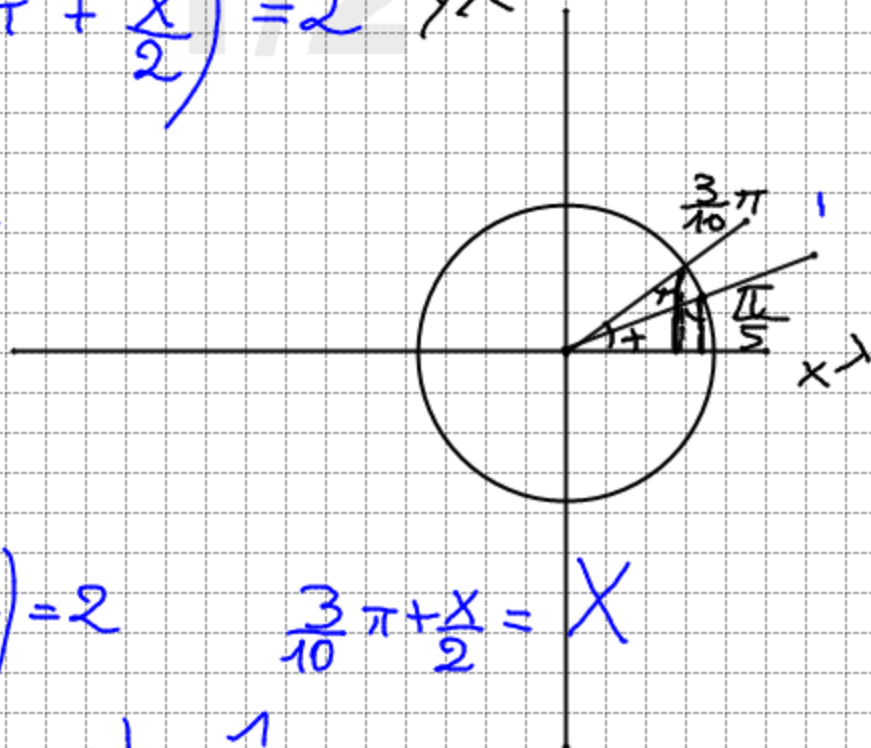
$$\frac{3}{10} \pi + \frac{x}{2} + \frac{\pi}{3} = \frac{\pi}{2} + 2k\pi \quad \text{con } k \in \mathbb{N}$$

$$\frac{x}{2} = \frac{\pi}{2} - \frac{\pi}{3} - \frac{3}{10} \pi + 2k\pi \quad \text{con } k \in \mathbb{N}$$

$$\frac{x}{2} = \frac{15-10-9}{30} \pi + 2k\pi \quad k \in \mathbb{N}$$

$$\frac{x}{2} = -\frac{4}{30} \pi + 2k\pi \quad k \in \mathbb{N}$$

$$x = -\frac{4}{15} \pi + 4k\pi \quad k \in \mathbb{N}$$



$$2\sqrt{3} \operatorname{sen}^2 x - 3 \operatorname{sen} x \cos x + 3 \cos^2 x - \sqrt{3} = 0$$

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

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

$$\text{Se } x = \frac{\pi}{2} : 2\sqrt{3} - \sqrt{3} = 0 \quad \text{NO!}$$

$$\text{Se } x = \frac{3}{2}\pi : 2\sqrt{3} - \sqrt{3} = 0 \quad \text{NO!}$$

Divido por $\cos^2 x$:

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

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

$$\operatorname{tg} x_{1,2} = \frac{3 \pm \sqrt{9 - 4\sqrt{3}(3 - \sqrt{3})}}{2\sqrt{3}}$$

$$\operatorname{tg} x_{1,2} = \frac{3 \pm \sqrt{9 - 12\sqrt{3} + 12}}{2\sqrt{3}} =$$

$$\operatorname{tg} x_1 = \frac{3 - 3 + 2\sqrt{3}}{2\sqrt{3}} = 1$$

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

$$\operatorname{tg} x_2 = \frac{3 + 3 - 2\sqrt{3}}{2\sqrt{3}} = \frac{6 - 2\sqrt{3}}{2\sqrt{3}}$$

$$x_1 = \frac{\pi}{4} + k\pi \quad k \in \mathbb{N} = \frac{2(3 - \sqrt{3})}{2\sqrt{3}}$$

$$x_2 = \operatorname{arctg} \frac{3 - \sqrt{3}}{3}$$