

# ESERCIZIO

1/3

$$\frac{1 + \sin^2\left(2x - \frac{\pi}{6}\right)}{\operatorname{Tg}\left(x - \frac{\pi}{3}\right) - 1} > 0$$

N)  $1 + \sin^2\left(2x - \frac{\pi}{6}\right) > 0$  sempre positivo (N)

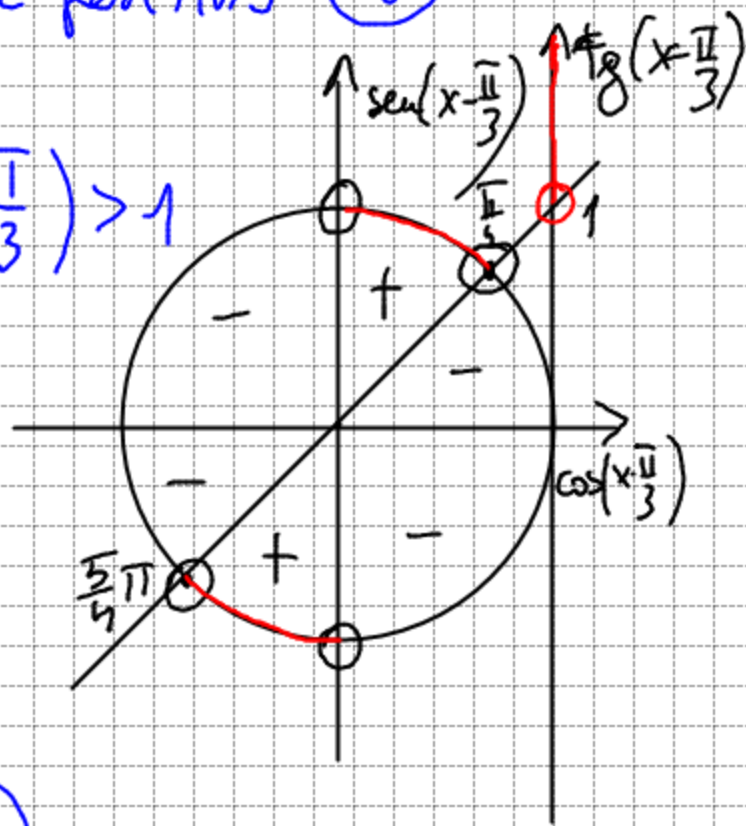
D)  $\operatorname{Tg}\left(x - \frac{\pi}{3}\right) - 1 > 0$   $\operatorname{Tg}\left(x - \frac{\pi}{3}\right) > 1$

$$\frac{\pi}{4} + k\pi < x - \frac{\pi}{3} < \frac{\pi}{2} + k\pi$$

$$\frac{\pi}{3} + \frac{\pi}{4} + k\pi < x < \frac{\pi}{3} + \frac{\pi}{2} + k\pi$$

$$\frac{7\pi}{12} + k\pi < x < \frac{5\pi}{6} + k\pi \quad (D)$$

Sol:  $\frac{7\pi}{12} + k\pi < x < \frac{5\pi}{6} + k\pi$



$$\frac{5}{4} \sin^2 x + \frac{1}{4} \sin^2 2x > \cos 2x$$

$$\frac{5}{4} \sin^2 x + \frac{1}{4} \left[ 2 \sin x \cos x \right]^2 > \cos^2 x - \sin^2 x$$

$$\frac{5}{4} \sin^2 x + \frac{1}{4} 4 \sin^2 x \cos^2 x > \cos^2 x - \sin^2 x$$

$$\frac{5}{4} \sin^2 x + \sin^2 x \cos^2 x - \cos^2 x + \sin^2 x > 0$$

$$5 \sin^2 x + 4 \sin^2 x \cos^2 x - 4 \cos^2 x + 4 \sin^2 x > 0$$

$$9 \sin^2 x + 4 \sin^2 x \cos^2 x - 4 \cos^2 x > 0$$

$$9 - 9 \cos^2 x + 4 \sin^2 x \cos^2 x - 4 \cos^2 x > 0$$

$$9 - 13 \cos^2 x + 4 \sin^2 x \cos^2 x > 0$$

$$9 - 13 \cos^2 x + (4 - 4 \cos^2 x) \cos^2 x > 0$$

$$9 - 13 \cos^2 x + 4 \cos^4 x > 0$$

$$9 - 9 \cos^2 x - 4 \cos^4 x > 0$$

$$\boxed{4 \cos^4 x + 9 \cos^2 x - 9 < 0}$$

$$4t^2 + 9t - 9 < 0 \quad *$$

$$4t^2 + 9t - 9 = 0$$

$$t_{1/2} = \frac{-9 \pm \sqrt{81 + 144}}{8} = \frac{-9 \pm 15}{8} = \begin{cases} t_1 = \frac{-9-15}{8} \\ t_2 = \frac{-9+15}{8} \end{cases}$$

$$t_1 = -3$$

$$t_2 = \frac{3}{4}$$

$$* (t+3) \left(t - \frac{3}{4}\right) < 0$$

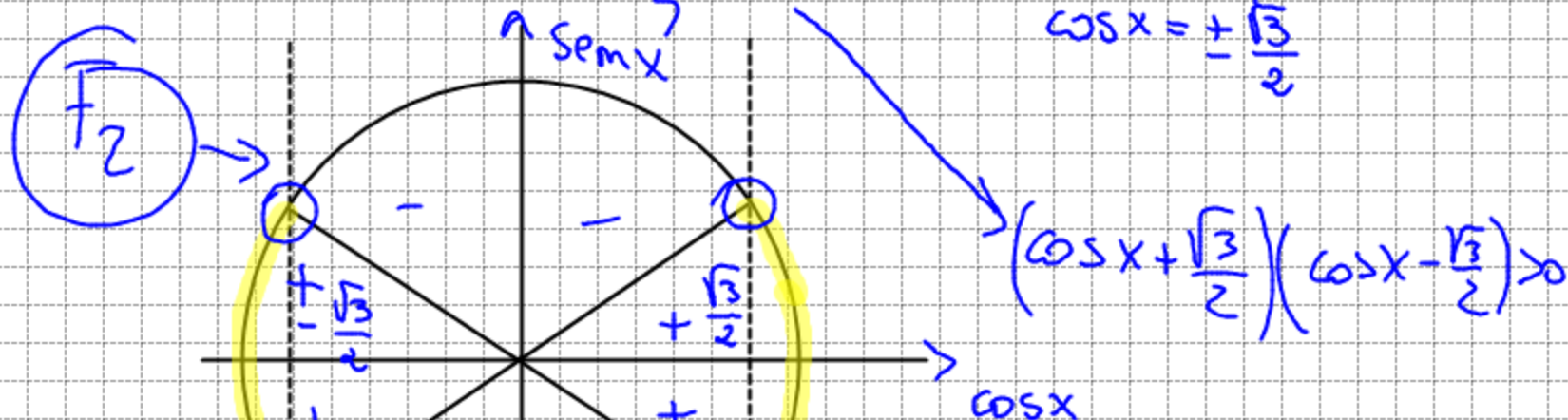
$$t_2 = \frac{3}{4} \Rightarrow$$

$$\underbrace{(\cos^2 x + 3)}_{F_1} \underbrace{\left(\cos^2 x - \frac{3}{4}\right)}_{\bar{F}_2} < 0$$

$$F_1 > 0 \quad \text{sempre} \quad \cos^2 x + 3 > 0$$

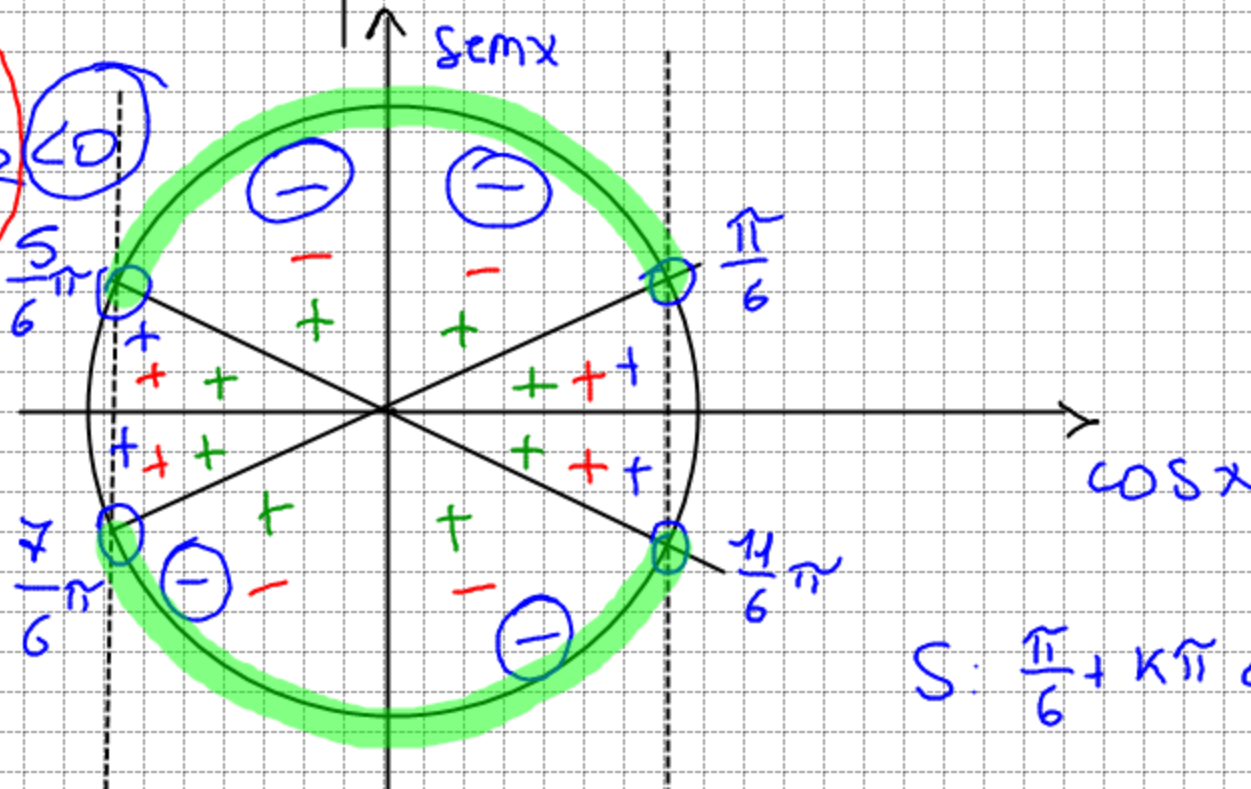
$$\bar{F}_2 > 0 \Rightarrow \cos^2 x - \frac{3}{4} > 0$$

$$\cos^2 x = \frac{3}{4} \\ \cos x = \pm \frac{\sqrt{3}}{2}$$



$$\left(\cos x + \frac{\sqrt{3}}{2}\right) \left(\cos x - \frac{\sqrt{3}}{2}\right) > 0 \\ \cos x < -\frac{\sqrt{3}}{2} \cup \cos x > \frac{\sqrt{3}}{2}$$

$$S = \underbrace{F_1}_{>0} \underbrace{F_2}_{<0}$$



$$S: \frac{\pi}{6} + k\pi < x < \frac{5\pi}{6} + k\pi$$

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$$a = 15 \text{ (IPOTENUSA)}$$

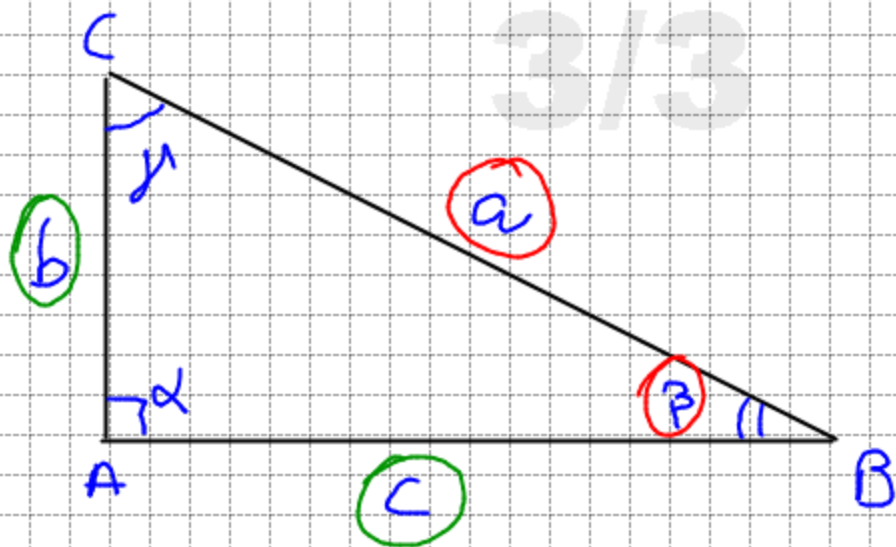
$$\operatorname{tg} \beta = \frac{3}{4}$$

$$b = ? = 9$$

$$c = ? = 12$$

$$\gamma = ?$$

$$\beta = ?$$



$$b = a \cdot \operatorname{semp} \beta = 15 \cdot \frac{3}{5} = 9$$

$$\operatorname{tg} \beta = \frac{3}{4}$$

$$\beta = 36^\circ 52' 14'' 6$$

$$\operatorname{semp} \beta = \frac{6}{10}$$

$$c = a \cdot \operatorname{cosp} \beta = 15 \cdot \operatorname{cosp} \beta = 15 \cdot \frac{8}{10} = 12$$