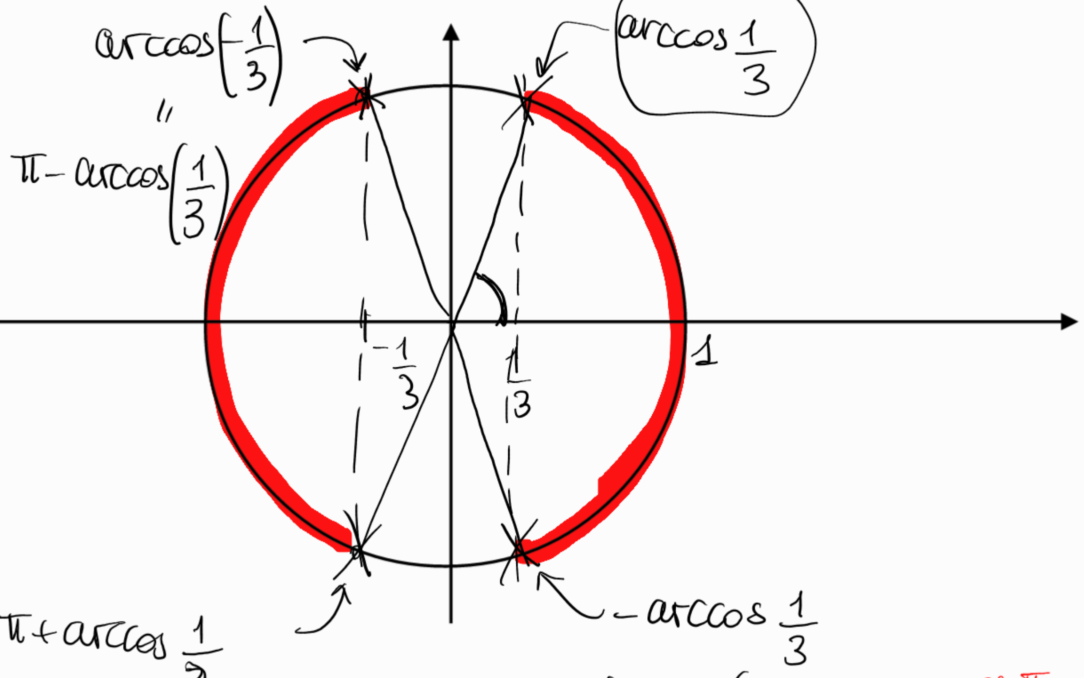
# Equazioni e diseq. trigonometriche

$$\cos^2 x > \frac{1}{9} \iff \left(\cos x < -\frac{1}{3}\right) \vee \left(\cos x > \frac{1}{3}\right)$$




$$\left(-\arccos\frac{1}{3} + 2k\pi < x < \arccos\frac{1}{3} + 2k\pi\right) \vee \left(\arccos\left(-\frac{1}{3}\right) + 2k\pi < x < \pi + \arccos\frac{1}{3} + 2k\pi\right)$$

$k \in \mathbb{Z}$

Più sinteticamente:

$$-\arccos\frac{1}{3} + k\pi < x < \arccos\frac{1}{3} + k\pi \qquad k \in \mathbb{Z}$$

Esercizio: risolverlo usando il grafico di $\cos x$

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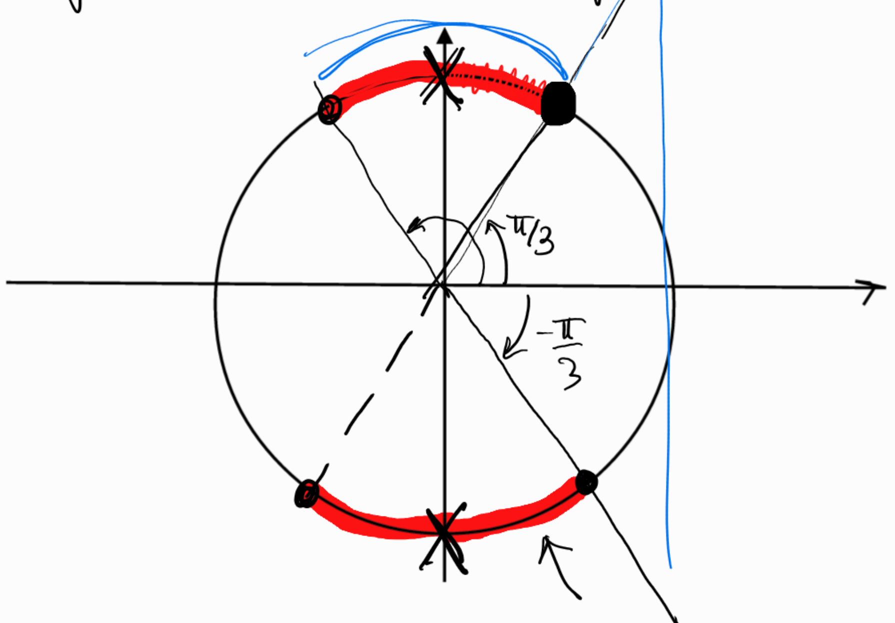
$$\operatorname{tg}^2 x \geq 3 \iff \left(\operatorname{tg} x \leq -\sqrt{3}\right) \vee \left(\operatorname{tg} x \geq \sqrt{3}\right)$$



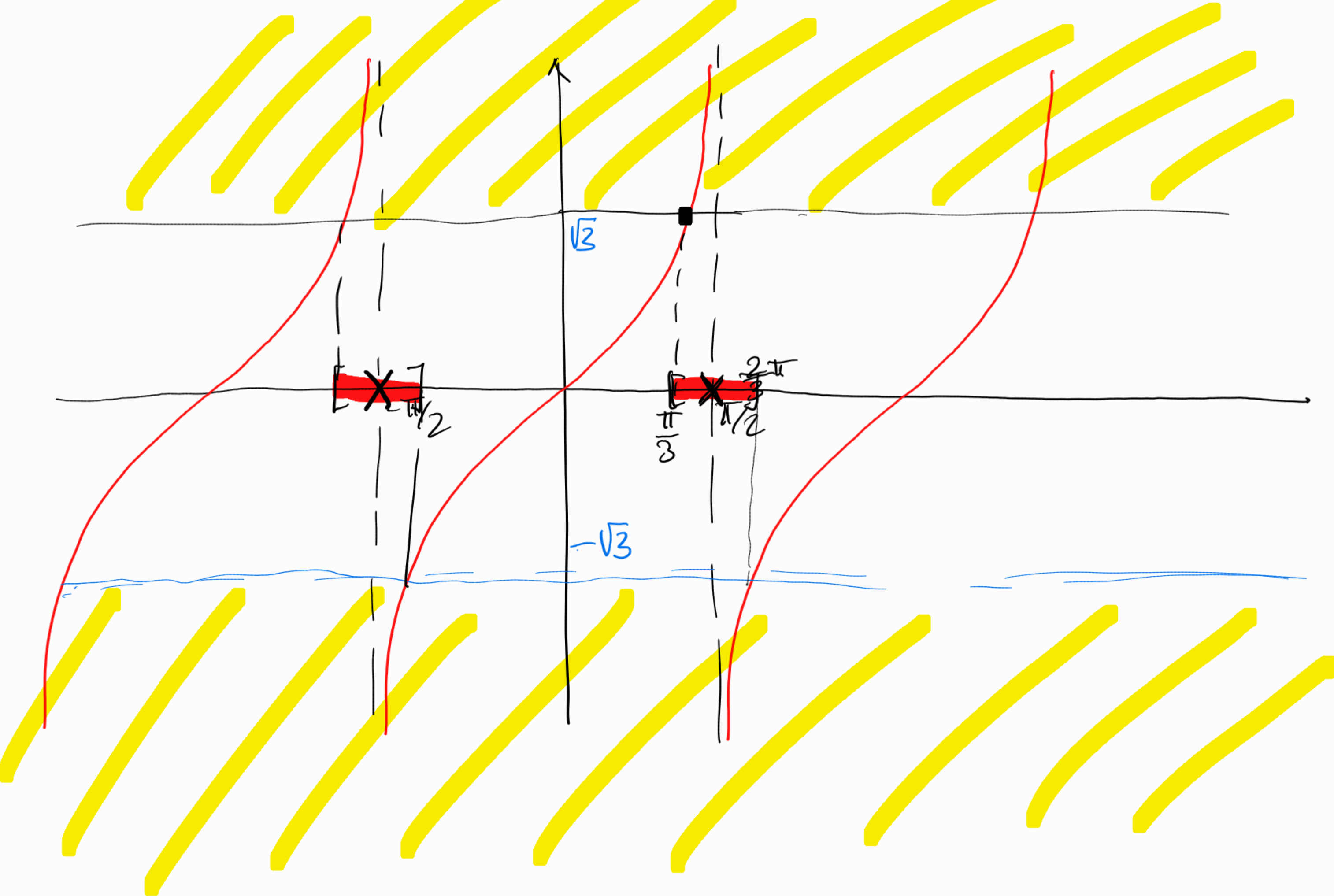
$$\left(-\frac{\pi}{2}+k\pi < x \leq -\frac{\pi}{3}+k\pi\right) \vee \left(\frac{\pi}{3}+k\pi \leq x < \frac{\pi}{2}+k\pi\right)$$

$k \in \mathbb{Z}$

oppure, equivalentemente

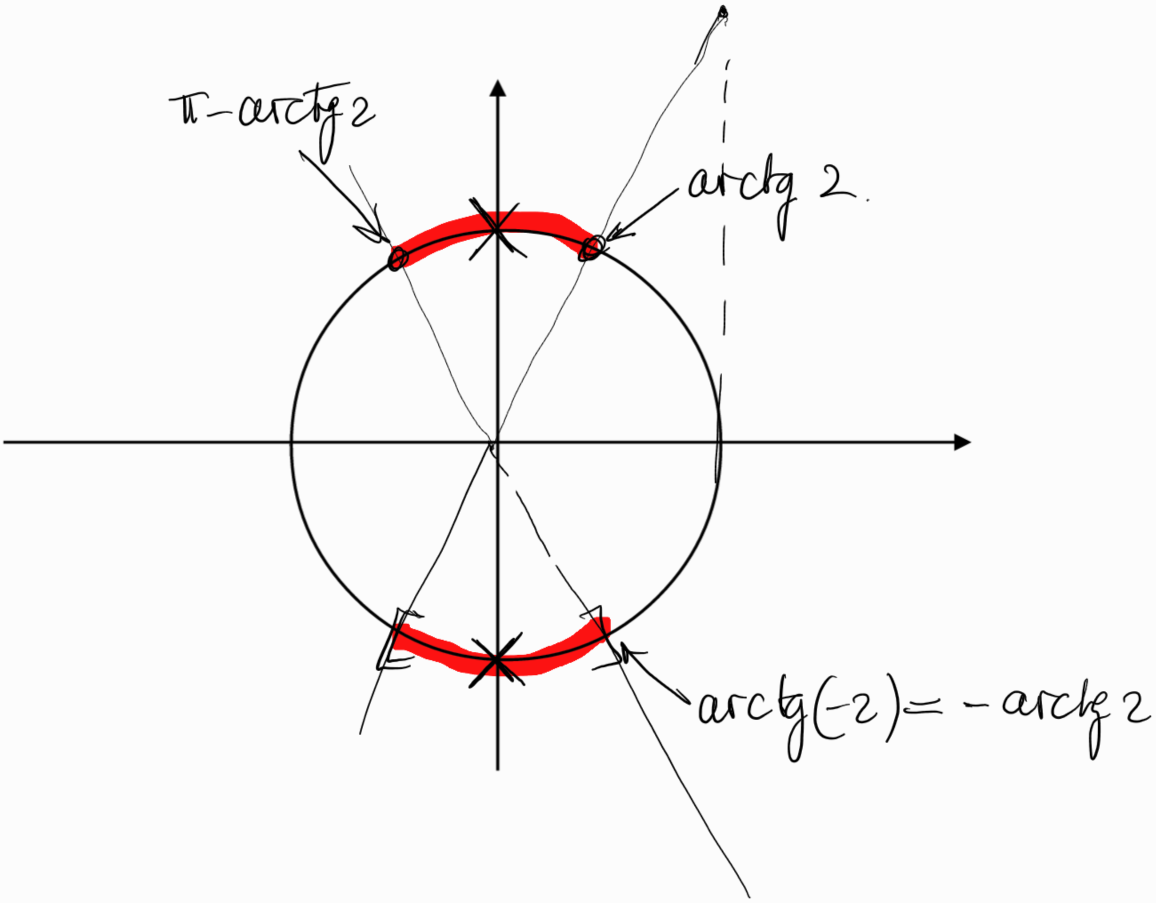
$$\frac{\pi}{3}+k\pi \leq x \leq \frac{2}{3}\pi+k\pi \qquad x \neq (2k+1)\frac{\pi}{2}.$$

$k \in \mathbb{Z}.$




Risolviamo ora:

$$\boxed{tg^2 x \geq 4} \iff (tg\,x \leq -2) \vee (tg\,x \geq 2)$$




$$\operatorname{arctg} 2 + k\pi < x < \pi - \operatorname{arctg} 2 + k\pi \qquad x \neq (2k+1)\frac{\pi}{2}$$

$k \in \mathbb{Z}$.

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$$\boxed{6\sin^2 x + \cos x - 4 \leq 0} \qquad \sin^2 x = 1 - \cos^2 x$$

$$6 - 6\cos^2 x + \cos x - 4 \leq 0$$

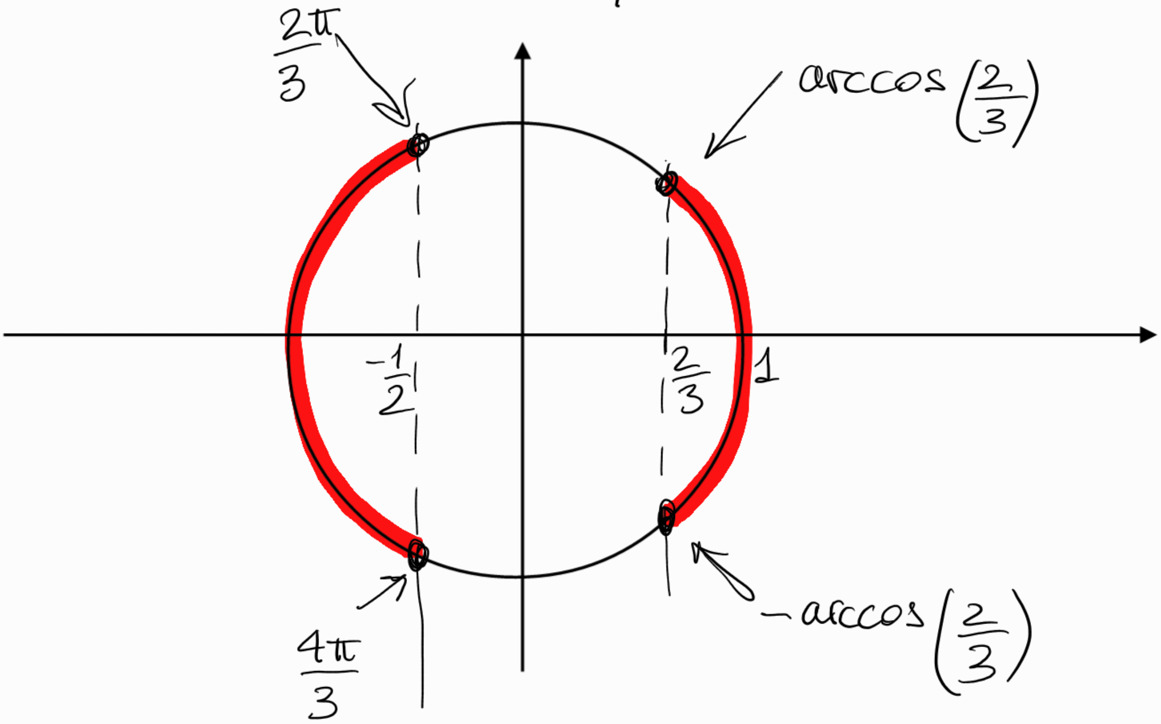
$$6\cos^2 x - \cos x - 2 \geq 0 \quad (*)$$

$$6t^2 - t - 2 \geq 0 \qquad (t = \cos x)$$

$$t_{1,2} = \frac{1 \pm \sqrt{1+48}}{12} = \frac{1 \pm 7}{12} = \begin{cases} -\frac{1}{2} \\ \frac{2}{3} \end{cases}$$

$$\left(t \leq -\frac{1}{2}\right) \vee \left(t \geq \frac{2}{3}\right)$$

$$(*) \iff \left(\cos x \le -\frac{1}{2}\right) \vee \left(\cos x \ge \frac{2}{3}\right)$$




Soluzioni:

$$\left(-\arccos\left(\frac{2}{3}\right)+2k\pi \le x \le \arccos\frac{2}{3}+2k\pi\right) \vee$$

$$\left(\frac{2}{3}\pi+2k\pi \le x \le \frac{4}{3}\pi+2k\pi\right). \qquad k\in\mathbb{Z}.$$

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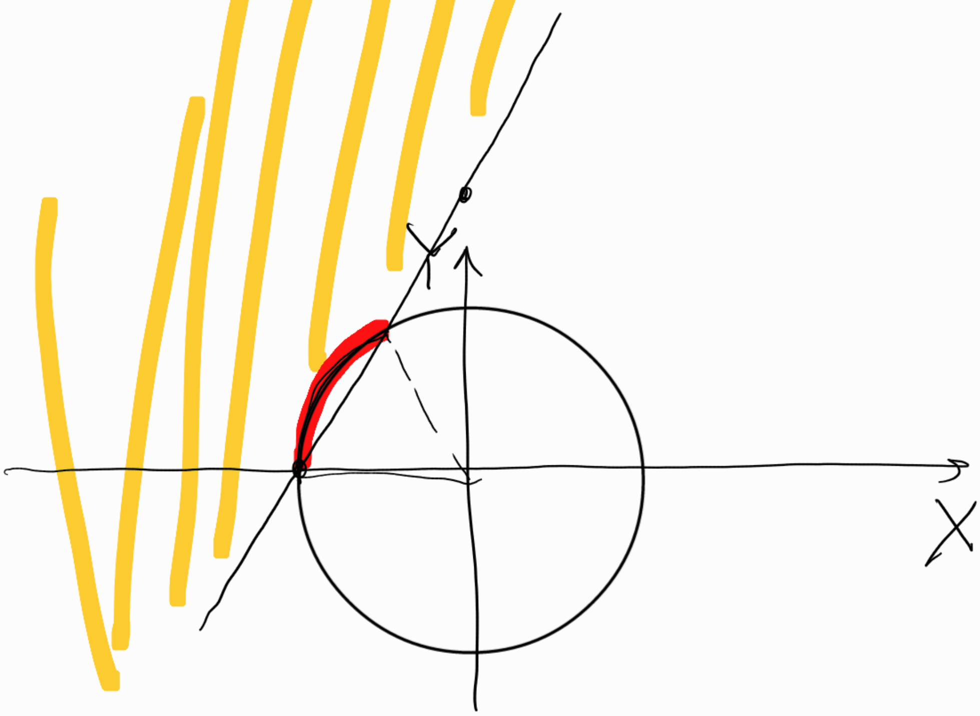
Risolvere $\boxed{\underbrace{\sin x}_{Y} - \sqrt{3}\underbrace{\cos x}_{X} > \sqrt{3}}$

1° modo: Si ricorda che $\cos x$ e $\sin x$ sono risp. ascissa e ordinata dei punti della circonf. unitaria

$\cos x = X$ $\qquad X^2+Y^2=1$

$\sin x = Y$

La disuguaglianza diventa
$$\begin{cases} \boxed{Y > \sqrt{3}(X+1)} \\ X^2+Y^2=1. \end{cases}$$




(... da continuare)