

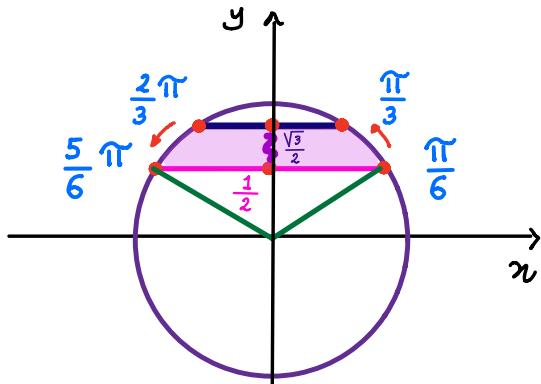
# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE RICONDUCIBILI AD ELEMENTARI

EX 1.

$$\frac{1}{2} \leq \sin x \leq \frac{\sqrt{3}}{2}$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO  
ORDINATA (SENO) COMPRESA TRA  $\frac{1}{2}$  E  $\frac{\sqrt{3}}{2}$



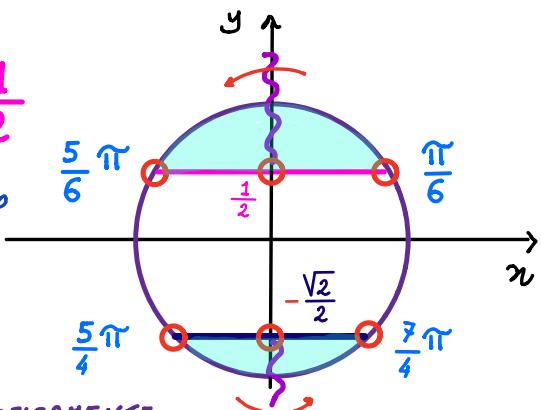
E SI INDIVIDUA LA SOLUZIONE GRAFICAMENTE

$$S: \frac{\pi}{6} + 2k\pi \leq x \leq \frac{\pi}{3} + 2k\pi \vee \frac{2\pi}{3} + 2k\pi \leq x \leq \frac{5\pi}{6} + 2k\pi$$

EX 2.

$$\sin x < -\frac{\sqrt{2}}{2} \vee \sin x > \frac{1}{2}$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO  
ORDINATA (SENO)  $< -\frac{\sqrt{2}}{2}$  E  $> \frac{1}{2}$



E SI INDIVIDUA LA SOLUZIONE GRAFICAMENTE

$$S: \frac{\pi}{6} + 2k\pi \leq x \leq \frac{5\pi}{6} + 2k\pi \vee \frac{5\pi}{4} + 2k\pi \leq x \leq \frac{7\pi}{4} + 2k\pi$$

*Chair*

1.

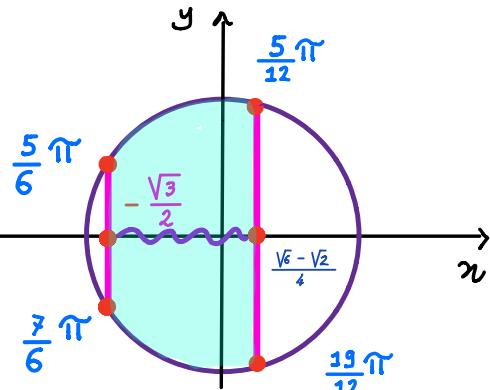
# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE RICONDUCIBILI AD ELEMENTARI

EX 3.

$$-\frac{\sqrt{3}}{2} \leq \cos x \leq \frac{\sqrt{6}-\sqrt{2}}{4}$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO ASCISSA (COSENO) COMPRESA TRA  $-\frac{\sqrt{3}}{2}$  E  $\frac{\sqrt{6}-\sqrt{2}}{4}$



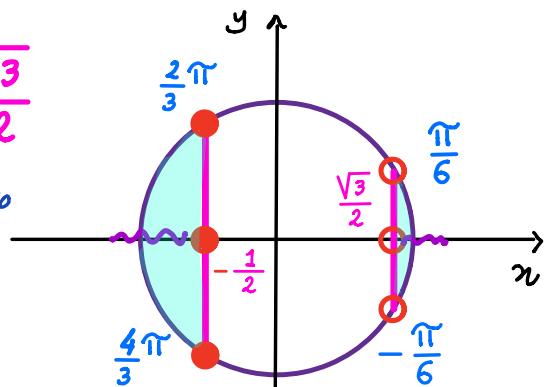
E SI INDIVIDUA LA SOLUZIONE GRAFICAMENTE

$$S: \frac{5\pi}{12} + 2k\pi \leq x \leq \frac{5\pi}{6} + 2k\pi \vee \frac{7\pi}{6} + 2k\pi \leq x \leq \frac{19\pi}{12} + 2k\pi$$

EX 4.

$$\cos x \leq -\frac{1}{2} \vee \cos x > \frac{\sqrt{3}}{2}$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO ASCISSA (COSENO)  $\leq -\frac{1}{2}$  E  $> \frac{\sqrt{3}}{2}$



E SI INDIVIDUA LA SOLUZIONE GRAFICAMENTE

$$S: -\frac{\pi}{6} + 2k\pi < x < \frac{\pi}{6} + 2k\pi \vee \frac{2\pi}{3} + 2k\pi \leq x \leq \frac{4\pi}{3} + 2k\pi$$

*Chair*

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# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE RICONDUCIBILI AD ELEMENTARI

EX 5.

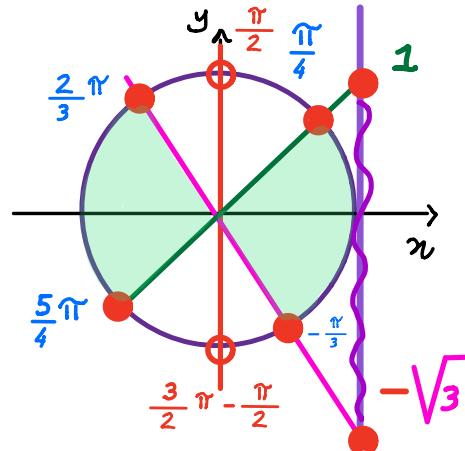
$$-\sqrt{3} \leq \tan x \leq 1$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO  
TANGENTE COMPRESA TRA  $-\sqrt{3}$  E 1

E SI INDIVIDUA LA SOLUZIONE GRFICAMENTE

S:

$$\frac{2}{3}\pi + k\pi \leq x \leq \frac{5}{4}\pi + k\pi$$



EX 6.

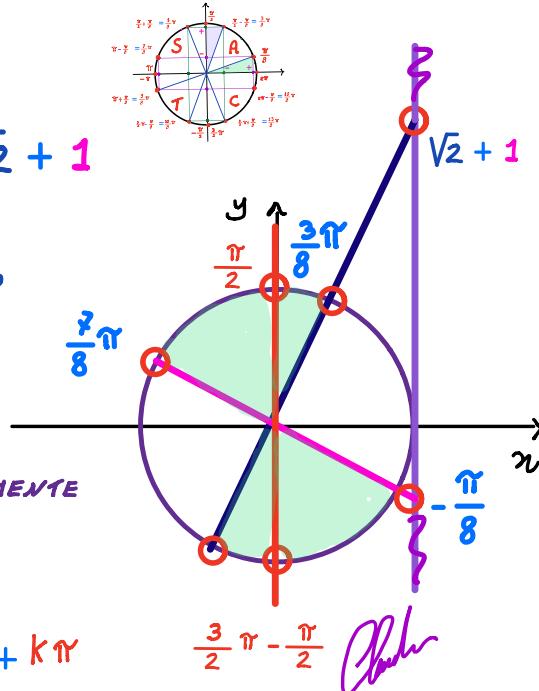
$$\tan x \leq -\sqrt{2} + 1 \quad \vee \quad \tan x > \sqrt{2} + 1$$

SI CERCANO I PUNTI DELLA CIRCONFERENZA CHE HANNO

$$\tan x \leq -\sqrt{2} + 1 \quad \text{e} \quad \tan x > \sqrt{2} + 1$$

E SI INDIVIDUA LA SOLUZIONE GRFICAMENTE

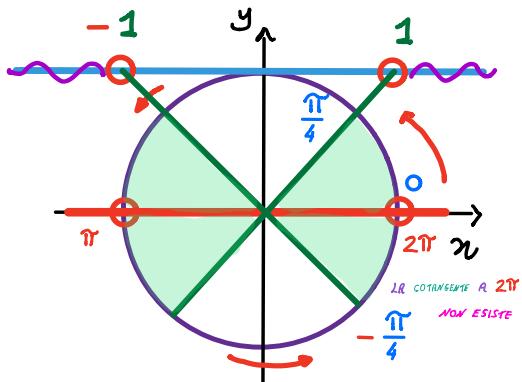
$$S: \frac{3}{8}\pi + k\pi \leq x \leq \frac{7}{8}\pi + k\pi \quad \wedge \quad x \neq \frac{\pi}{2} + k\pi$$



# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE ELEMENTARI

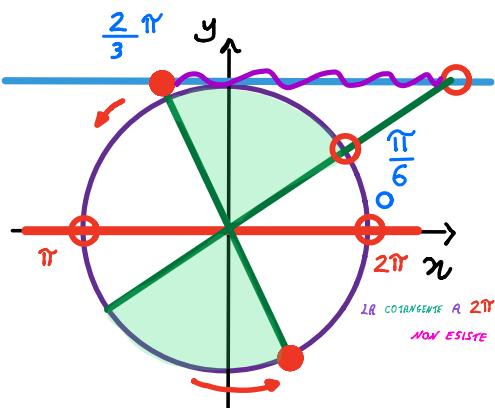
EX 7.  $\cot x < -1 \vee \cot x \geq 1$



$$S: -\frac{\pi}{4} + k\pi \leq x \leq \frac{\pi}{4} + k\pi \quad \wedge \quad x \neq o + k\pi$$


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EX 8.  $-\frac{\sqrt{3}}{3} \leq \cot x < \sqrt{3}$

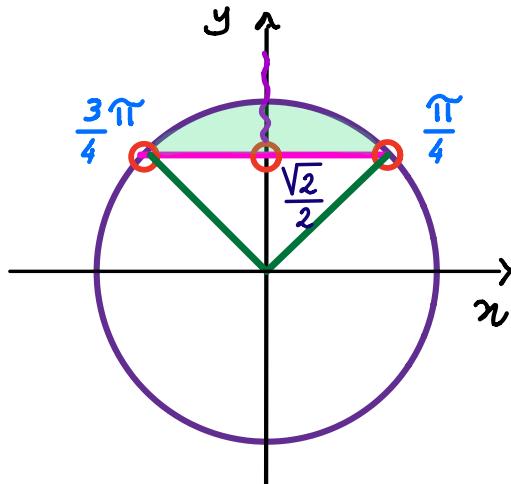


$$S: \frac{\pi}{6} + k\pi < x \leq \frac{2\pi}{3} + k\pi$$

# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE ELEMENTARI

EX 9.  $\sin 2x > \frac{\sqrt{2}}{2}$



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

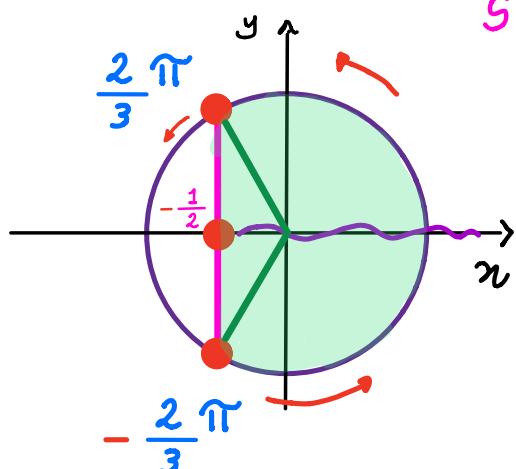
SI DIVIDE PER 2

$$\frac{\pi}{8} + k\pi < x < \frac{3\pi}{8} + k\pi$$

$$S: \frac{\pi}{8} + k\pi < x < \frac{3\pi}{8} + k\pi$$

EX 10.

$$\cos\left(\frac{x}{2} - \frac{\pi}{3}\right) \geq -\frac{1}{2}$$



$$S: -\frac{2\pi}{3} + 2k\pi \leq \frac{x}{2} - \frac{\pi}{3} \leq \frac{2\pi}{3} + 2k\pi$$

$$-\frac{2\pi}{3} + \frac{\pi}{3} = -\frac{\pi}{3}$$

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

E SI MOLTIPLICARE PER 2

$$S: -\frac{2}{3}\pi + 4k\pi \leq x \leq 2\pi + 4k\pi$$

# GONIOMAGIA A COLORI PER TUTTI

## DISEQUAZIONI GONIOMETRICHE ELEMENTARI ADESSO PROVACI TU...

$$1) -1 < \sin x \leq \frac{\sqrt{2}}{2}$$

$$2) \sin x \leq -\frac{\sqrt{3}}{2} \vee \sin x > -\frac{1}{2}$$

$$3) -\frac{\sqrt{2}}{2} \leq \cos x \leq \frac{\sqrt{6} + \sqrt{2}}{4}$$

$$4) \cos x < \frac{\sqrt{6} - \sqrt{2}}{4} \vee \cos x \geq \frac{\sqrt{2}}{2}$$

$$5) -\sqrt{3} \leq \tan x < \sqrt{2} + 1$$

$$6) \tan x < -1 \vee \tan x \geq \sqrt{3}$$

$$7) \cot x < 0 \vee \cot x \geq \sqrt{2} + 1$$

$$8) -1 \leq \cot x \leq \sqrt{3}$$

$$9) 0 < \sin 2x \leq \frac{\sqrt{3}}{2}$$

$$10) -\frac{1}{2} \leq \cos \frac{x}{2} \leq \frac{\sqrt{2}}{2}$$

# DISEQUAZIONI DI 2° GRADO

1)  $2 \sin^2 x - \sin x \geq 0$

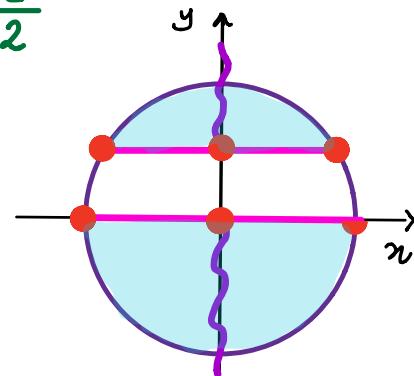
$$\sin x (2 \sin x - 1) \geq 0$$

$\frac{1}{2}$

VALORI ESTERNI

$$\sin x \leq 0 \vee \sin x \geq \frac{1}{2}$$

$S:$   $\leq x \leq$



$$S: \frac{\pi}{6} + 2k\pi \leq x \leq \frac{5\pi}{6} + 2k\pi \quad \vee \quad \pi + 2k\pi \leq x \leq 2\pi + 2k\pi$$

2)  $2 \cos^2 x - 1 > 0$

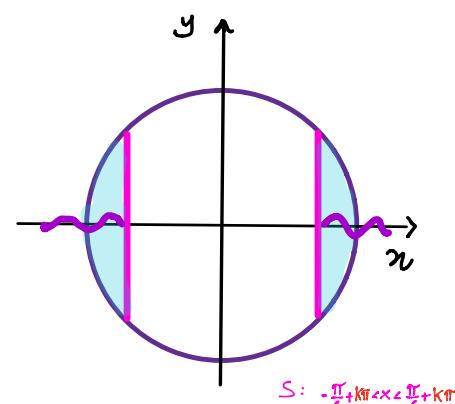
$$\cos^2 x > \frac{1}{2}$$

$$\pm \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

VALORI ESTERNI

$$\cos x < -\frac{\sqrt{2}}{2} \vee \cos x > \frac{\sqrt{2}}{2}$$

$S:$   $< x <$

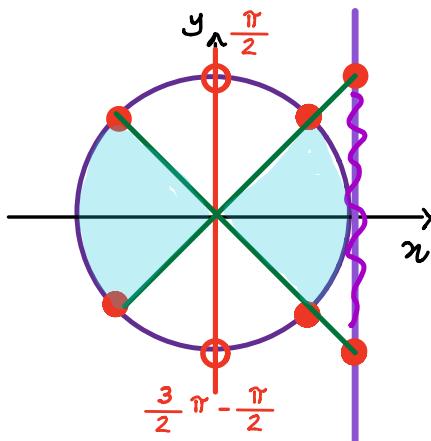


$$S: -\frac{\pi}{4} + k\pi < x < \frac{3\pi}{4} + k\pi$$

$$3) \quad \tan^2 x - 1 \leq 0$$

$$\tan^2 x \leq 1$$

VALORI INTERNI



$$S: \quad \underline{x} \leq \overline{x}$$

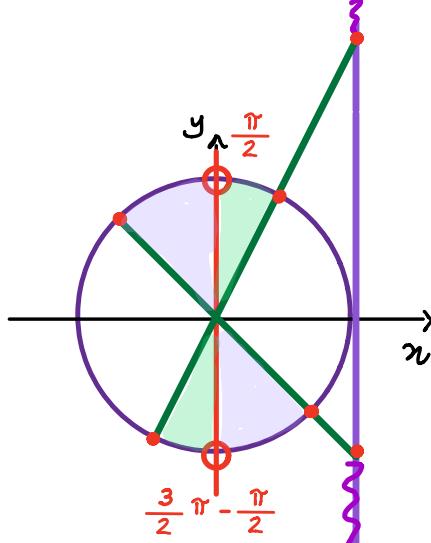
$$4) \quad \tan^2 x - \tan x - 2 \geq 0$$

$$\Delta = 1 + 8 = 9$$

$$\tan x = \frac{1 \pm 3}{2} \quad \begin{matrix} -1 \\ 2 \end{matrix}$$

VALORI ESTERNI

$$\tan x \leq -1 \quad \vee \quad \tan x \geq 2$$



$$S: \quad \underline{x} \leq \overline{x}$$

$$S: d + k\pi \leq x \leq \frac{3}{4}\pi + k\pi \wedge x \neq \frac{\pi}{2} + k\pi$$

$$5) \quad 2\sin^2 x - \sin x - 1 \geq 0$$

$$\Delta = 1 + 8 = 9$$

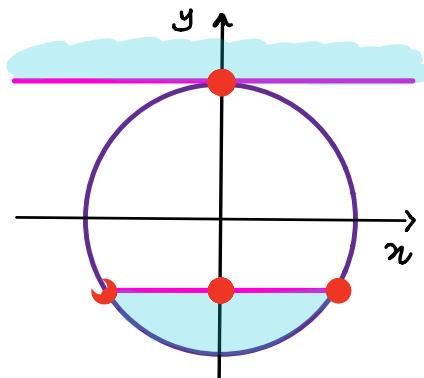
$$\sin x = \frac{1 \pm 3}{4}$$

$\frac{1}{2}$   
 $1$

VALORI ESTERNI

$$\sin x \leq -\frac{1}{2} \vee \sin x \geq 1$$

$$S: \quad \underline{x} \leq \underline{x} \leq \overline{x}$$



$$6) \quad 4\cos^2 x - 4\cos x + 1 > 0 \quad \Delta = 0$$

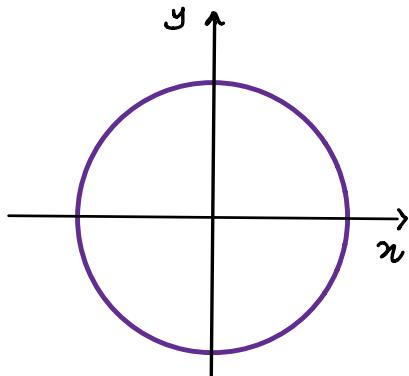
$$(2\cos x - 1)^2 > 0 \quad \leadsto \quad \cos x \neq \frac{1}{2}$$

$$S: \quad x \neq \pm \frac{\pi}{3} + 2k\pi$$

$$7) \quad 2\cos^2x - 3\cos x + 1 \leq 0$$

$\Delta =$

VALORI INTERNI



$$S: \quad \underline{\cos x} \leq \underline{1}$$

$$8) \quad 2\cos^2x - \sin x - 1 \geq 0$$

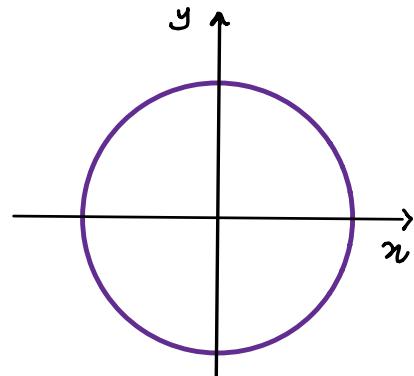
$$\cos^2x = 1 - \sin^2x$$

$$2 - 2\sin^2x - \sin x - 1 \geq 0$$

$$+ 2\sin^2x + \sin x - 1 \leq 0$$

$\Delta =$

VALORI INTERNI



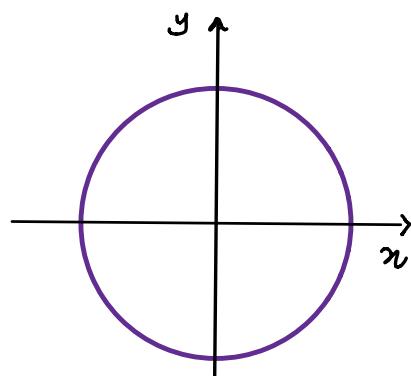
$$S: \quad \leq x \leq$$

g)  $\sin^2 x + 1 - \cos^2 x \geq 0$

$$\sin^2 x = 1 - \cos^2 x$$

$\Delta =$

VALORI INTERNI

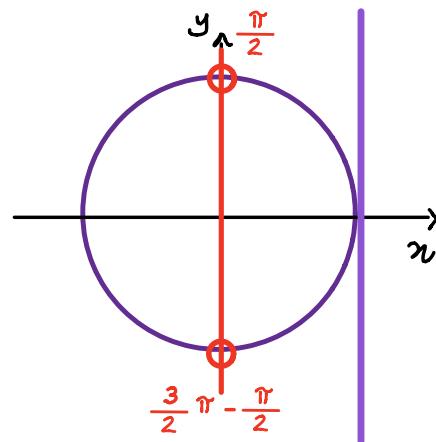


$$S: \quad \leq x \leq$$

$$10) \quad 4\tan^2 x + 2(1 + \sqrt{3}) \tan x + \sqrt{3} > 0$$

$$\frac{\Delta}{4} = (1 + \sqrt{3})^2 -$$

VALORI ESTERNI



$$S: \quad \leq x \leq$$