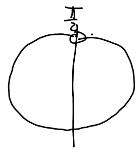
SI INDIVIDUI IL DOMINIO DELLE SEGUENTI FUNZIONI

- $f(x) = \sqrt{\dfrac{1-\cos x}{1-\operatorname{sen} x}}$ $\qquad \dfrac{1-\cos x}{1-\operatorname{sen} x} \geq 0 \qquad 1-\operatorname{sen} x \neq 0 \qquad x \neq \frac{\pi}{2} + 2k\pi$

  $\mathbb{R} \setminus \left\{ \frac{\pi}{2} + 2k\pi \right\} \quad k \in \mathbb{Z}$

  $\bigcup_{k\in\mathbb{Z}} \left(\frac{\pi}{2} + 2k\pi, \frac{5}{2}\pi + 2k\pi \right)$



- $f(x) = \ln\left(1 - 2\cos\frac{x}{2}\right)$

- $f(x) = \dfrac{1-2\operatorname{sen}^2 x}{1-2\cos x}$ $\qquad \frac{1}{2} \neq \cos x \qquad x \neq \pm\frac{\pi}{3} + 2k\pi$

- $f(x) = \arccos\dfrac{x+1}{x-2}$

RIPASSO DIS. TRIGONOMETRICHE

$\operatorname{sen} x > -\frac{1}{2}$ ✓

$\cos x \leq \frac{\sqrt{3}}{2}$ ✓

$\operatorname{sen} x \leq 0$ ✓

$\cos x \geq \frac{\sqrt{2}}{2}$ ✓

$\cos x \geq -\frac{\sqrt{3}}{2}$ ✓

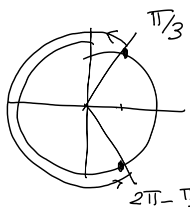
$\operatorname{sen} x > \frac{3}{4}$ *

$\cos x < \frac{1}{7}$ *

$f(x) = \ln\left(1 - 2\cos\frac{x}{2}\right)$

$1 - 2\cos\frac{x}{2} > 0 \qquad \cos\frac{x}{2} < \frac{1}{2} \qquad t = \frac{x}{2}$

$\cos t < \frac{1}{2}$



$2\pi - \frac{\pi}{3} = \frac{5}{3}\pi$

$\frac{\pi}{3} + 2k\pi < t < \frac{5}{3}\pi + 2k\pi$

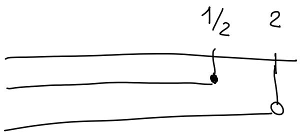
$\frac{\pi}{3} + 2k\pi < \frac{x}{2} < \frac{5}{3}\pi + 2k\pi$

$$\frac{2}{3}\pi + 4k\pi < x < \frac{10}{3}\pi + 4k\pi \qquad k \in \mathbb{Z}$$

$$\bigcup_{k\in\mathbb{Z}} \left(\frac{2}{3}\pi + \cancel{2}4k\pi , \ \frac{10}{3}\pi + 4k\pi \right)$$

$$f(x) = \arccos \frac{x+1}{x-2} \qquad\qquad -1 \leq \frac{x+1}{x-2} \leq 1$$

$$\begin{cases} x \neq 2 \\ \dfrac{x+1}{x-2} + 1 \geq 0 \\ \dfrac{x+1}{x-2} - 1 \leq 0 \end{cases} \qquad \begin{cases} x \neq 2 \\ \dfrac{x+1+x-2}{x-2} \geq 0 \\ \dfrac{\cancel{x}+1-\cancel{x}+2}{x-2} \leq 0 \end{cases} \qquad \begin{cases} x \neq 2 \\ 2x-1 \leq 0 \\ x-2 < 0 \end{cases} \qquad \begin{cases} x \leq \dfrac{1}{2} \\ x < 2 \end{cases}$$

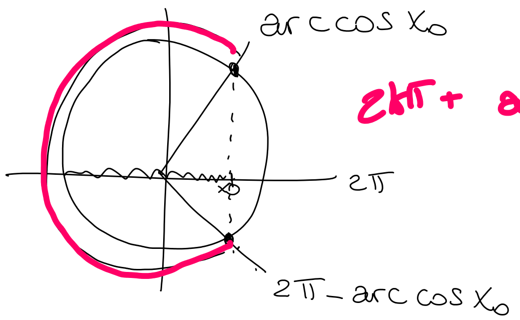


$$x \leq \frac{1}{2}$$

$$\left(-\infty, \frac{1}{2}\right]$$

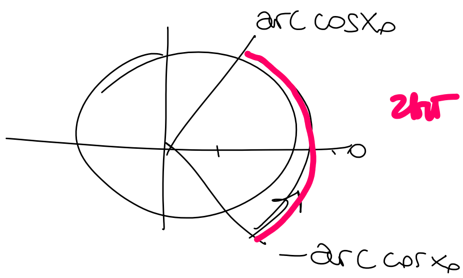
$\cos x < x_0$

$0 < x_0 < 1$



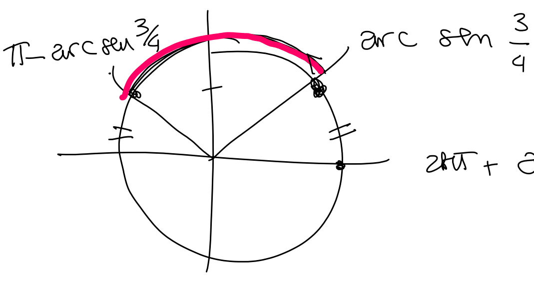
$$2k\pi + \arccos x_0 < x < 2\pi - \arccos x_0 + 2k\pi$$

$\cos x > x_0$



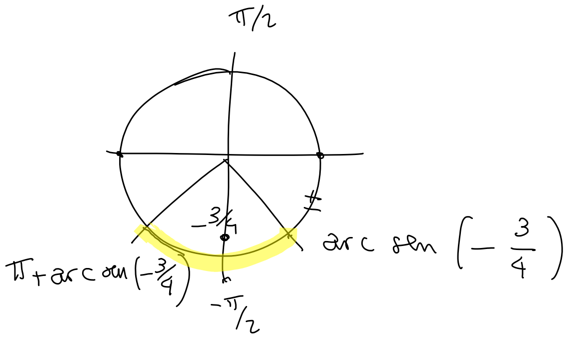
$$2k\pi - \arccos x_0 < x < \arccos x_0 + 2k\pi$$

$$\operatorname{sen} x > \frac{3}{4}$$



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

$\operatorname{sen} x < -\frac{3}{4}$



$$\pi + \arcsin\left(-\tfrac{3}{4}\right) < x < \arcsin\left(-\tfrac{3}{4}\right) + 2\pi$$

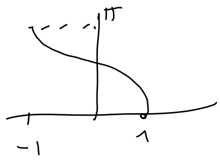
STUDIARE IL SEGNO DELLE FUNZIONI SOPRA DEFINITE

$f(x) = \sqrt{\dfrac{1-\cos x}{1-\operatorname{sen} x}}$ È SEMPRE ≥ 0 NEL SUO DOMINIO

$f(x)=0$ se $x = 2k\pi$

$f(x) = \arccos \dfrac{x+1}{x-2}$ È SEMPRE ≥ 0 NEL SUO DOMINIO

$f(x)=0$ se $\dfrac{x+1}{x-2} = 1 \iff \dfrac{\cancel{x}+1-\cancel{x}+2}{x-2} = 0$ $\nexists x \in \mathbb{R}$



$\ln\left(1-2\cos\frac{x}{2}\right)$

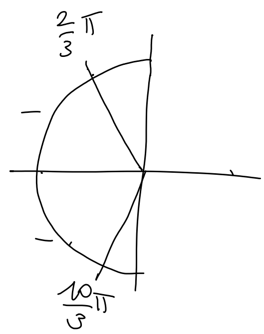
$$\frac{2}{3}\pi + 4k\pi < x < \overset{3\pi+\frac{\pi}{3}}{\overset{\parallel}{\frac{10}{3}\pi}} + 4k\pi$$

$\ln\left(1-2\cos\frac{x}{2}\right) > 0$

$\cancel{1} - 2\cos\frac{x}{2} > \cancel{1}$

$\cos\frac{x}{2} < 0$

$\cos t < 0$



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

LA FUNZIONE È POSITIVA

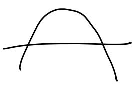
$$\begin{cases} \pi + 4k\pi < x < 3\pi + 4k\pi \\ \frac{2}{3}\pi + 4k\pi < x < \frac{10}{3}\pi + 4k\pi \end{cases}$$

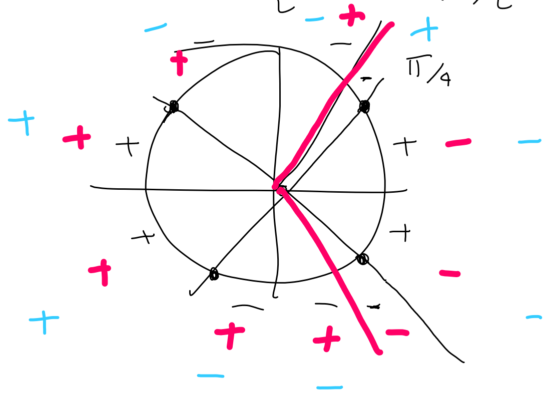
$$\frac{1-2\,\text{sen}^2 x}{1-2\cos x} > 0$$

$N \geq 0$ $\qquad 1-2\,\text{sen}^2 x = 0$ $\qquad \frac{1}{2} = \text{sen}^2 x$ $\qquad \text{sen}\, x = \pm\frac{\sqrt{2}}{2}$

$-\frac{\sqrt{2}}{2} < \text{sen}\, x < \frac{\sqrt{2}}{2}$

$1-2t^2 > 0$ $\qquad t = \text{sen}\, x$





$1-2\cos x > 0$

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