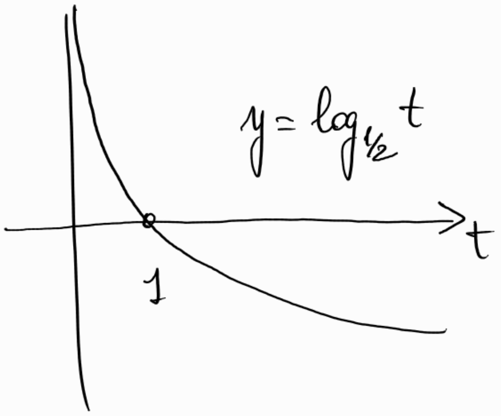
Trovare il dominio di $f(x)=\sqrt{\log_{1/2}\left(\log_2\left(2\operatorname{sen}^2 x-\cos x\right)\right)}$

$$\log_{1/2}\Big(\underbrace{\log_2\left(2\operatorname{sen}^2 x-\cos x\right)}_{t}\Big)\geq 0 \qquad \log_{1/2} t \geq 0 \Leftrightarrow 0<t\leq 1$$

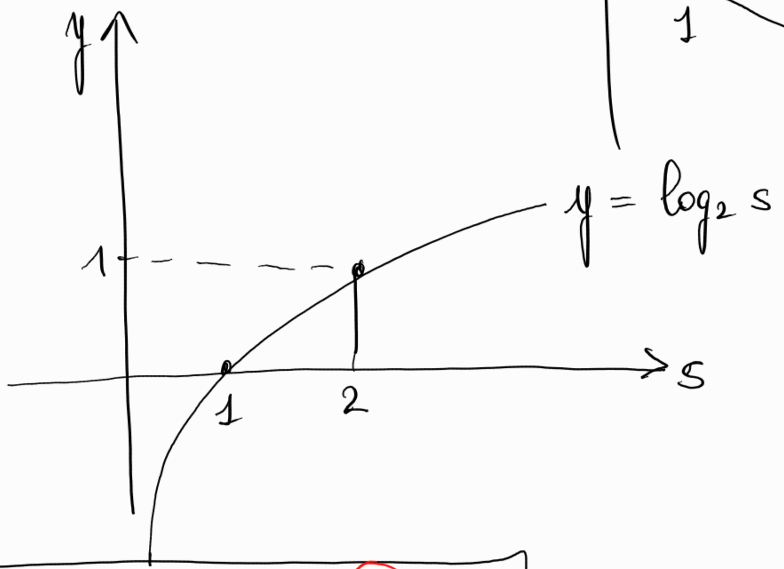


$$0<\log_2\big(\underbrace{2\operatorname{sen}^2 x-\cos x}_{s}\big)\leq 1$$

$$0<\log_2 s\leq 1$$

$$\Updownarrow$$

$$1<s\leq 2$$



$$\boxed{1 \overset{(A)}{<} 2\operatorname{sen}^2 x-\cos x \overset{(B)}{\leq} 2}$$

A

$$2\operatorname{sen}^2 x-\cos x>1 \qquad \operatorname{sen}^2 x=1-\cos^2 x$$

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

$$2\cos^2 x+\cos x-1<0 \qquad t=\cos x$$

$$2t^2+t-1<0 \qquad t_{1,2}=\frac{-1\pm\sqrt{1+8}}{4}=\frac{-1\pm 3}{4}=\begin{cases}-1\\ \frac{1}{2}\end{cases}$$

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

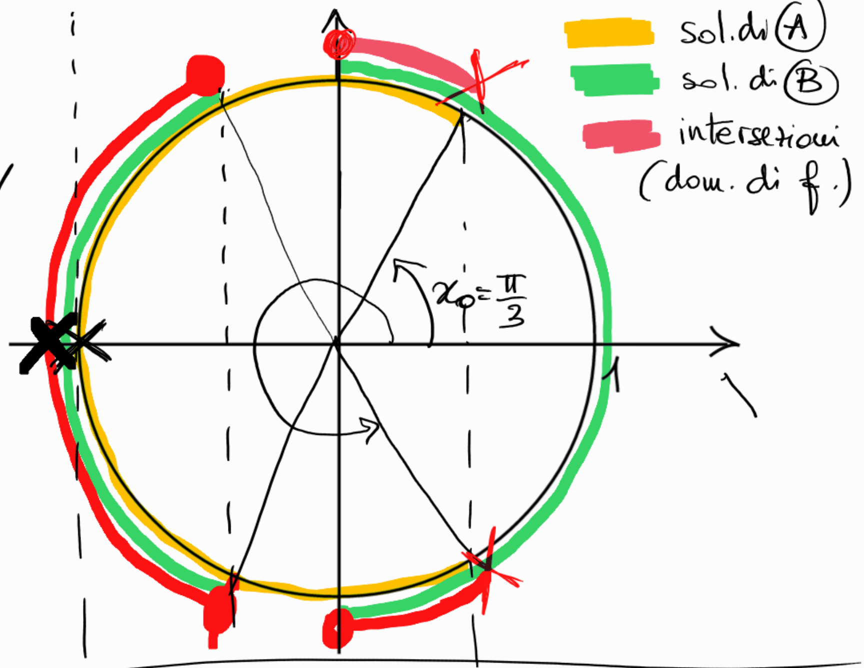
$$-1<\cos x<\frac{1}{2}$$

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

$$\left(\pi+2k\pi < x < \frac{5}{3}\pi+2k\pi\right)$$

$$\iff \left(\frac{\pi}{3}+2k\pi < x < \frac{5}{3}\pi+2k\pi\right)$$

$$\cap \ (x \neq \pi+2k\pi)$$



$$(B) \qquad 2\operatorname{sen}^2 x - \cos x \leq 2$$

$$\cancel{2} - 2\cos^2 x - \cos x \leq \cancel{2}$$

$$\boxed{2\cos^2 x + \cos x \geq 0}$$

$$\left(\cos x \leq -\frac{1}{2}\right) \vee (\cos x \geq 0)$$

$$(B) \iff \left(-\frac{\pi}{2}+2k\pi \leq x \leq \frac{\pi}{2}+2k\pi\right) \vee \left(\frac{2\pi}{3}+2k\pi \leq x \leq \frac{4}{3}\pi+2k\pi\right)$$

Dominio di f.

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

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

$$\vee\left(\pi+2k\pi < x \leq \frac{4}{3}\pi+2k\pi\right) \vee$$

$$\vee\left(\frac{3}{2}\pi+2k\pi \leq x < \frac{5}{3}\pi+2k\pi\right)$$

Risolvere la diseq^{ne}

$$2\sin x - 1 < 2\cos x - \operatorname{tg} x \qquad \operatorname{tg} x = \frac{\sin x}{\cos x}$$

$$2\sin x - 1 < 2\cos x - \frac{\sin x}{\cos x} \qquad \text{C.E.} \quad x \neq \frac{\pi}{2}+k\pi.$$

$$\frac{2\sin x\cos x - \cos x}{\cos x} < \frac{2\cos^2 x - \sin x}{\cos x}$$

$$\frac{2\sin x\cos x - \cos x - 2\cos^2 x + \sin x}{\cos x} < 0.$$

$$\frac{2\cos x(\sin x - \cos x) + (\sin x - \cos x)}{\cos x} < 0$$

$$\frac{(2\cos x+1)(\sin x-\cos x)}{\cos x}<0$$

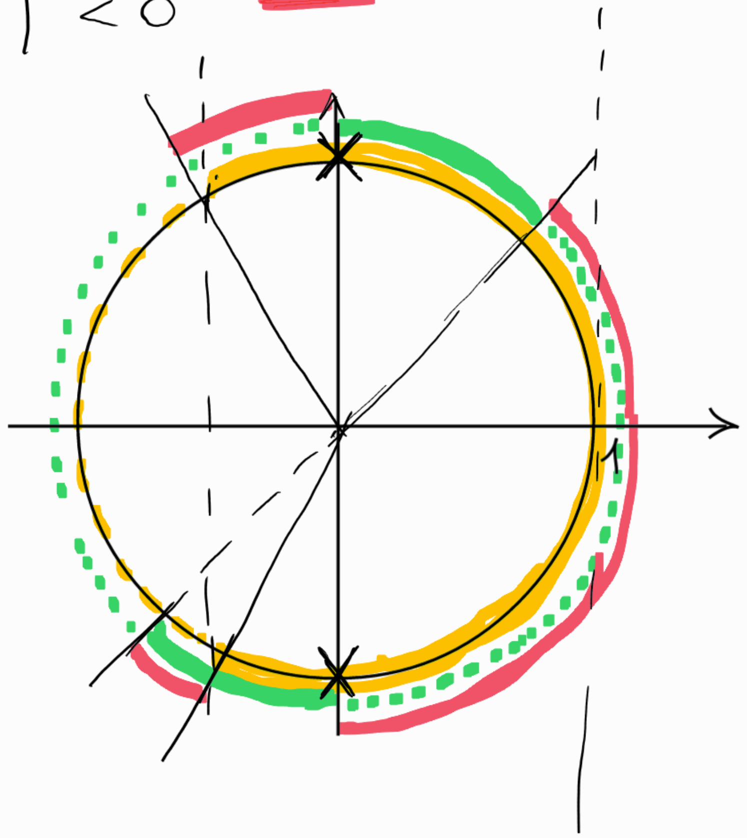
$$(2\cos x+1)\left(\operatorname{tg} x-1\right)<0$$

$2\cos x+1>0$

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

$\operatorname{tg} x-1>0$

$\operatorname{tg} x>1$



Soluzioni della diseq^{ne}:

$$\left(-\frac{3}{4}\pi+2k\pi<x<-\frac{2}{3}\pi+2k\pi\right)\vee\left(-\frac{\pi}{2}+2k\pi<x<\frac{\pi}{4}+2k\pi\right)\vee$$

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

Disegnare il grafico di $f(x)=\arcsin(\sin x)$

dominio: $\mathbb{R}$. $f(x)$ è periodica di periodo 2π.

OSS se $x\in\left[-\frac{\pi}{2},\frac{\pi}{2}\right]\Rightarrow f(x)=x$