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$$\frac{\sin\left(\alpha-\frac{\pi}{2}\right)\sin(-\alpha)+\cos\left(\frac{3}{2}\pi-\alpha\right)\sin\left(\frac{11}{2}\pi+\alpha\right)+\cos(3\pi+\alpha)}{-\tan\left(\alpha+\frac{\pi}{2}\right)\cot\left(\alpha-\frac{3}{2}\pi\right)-\sin(\alpha+\pi)+\sin(7\pi-\alpha)}=$$

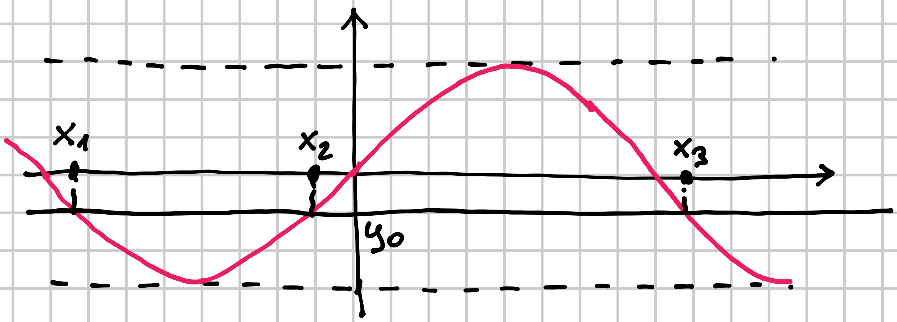
$$=\frac{-\sin\left(\frac{\pi}{2}-\alpha\right)\left[-\sin\alpha\right]+\cos\left(\frac{\pi}{2}+\pi-\alpha\right)\sin\left(\overbrace{5\pi}^{4\pi+\pi}+\frac{\pi}{2}+\alpha\right)+\cos(2\pi+\pi+\alpha)}{+\cot\alpha\cdot\cot\left(\alpha-\frac{\pi}{2}-\pi\right)+\sin\alpha+\sin(6\pi+\pi-\alpha)}=$$

$$=\frac{-\cos\alpha\cdot(-\sin\alpha)-\sin(\pi-\alpha)\cdot\left(-\sin\left(\frac{\pi}{2}+\alpha\right)\right)-\cos\alpha}{\cot\alpha\cdot\left(-\cot\left(\frac{\pi}{2}-\alpha\right)\right)+\sin\alpha+\sin\alpha}=$$

$$=\frac{\cos\alpha\sin\alpha+\sin\alpha\cos\alpha-\cos\alpha}{-\cot\alpha\cdot\tan\alpha+2\sin\alpha}=\frac{2\cos\alpha\sin\alpha-\cos\alpha}{2\sin\alpha-1}=$$

$$=\frac{\cos\alpha\,\cancel{(2\sin\alpha-1)}}{\cancel{2\sin\alpha-1}}=\boxed{\cos\alpha}$$

$f:\mathbb{R}\to[-1,1]$ $\quad f(x)=\sin x$

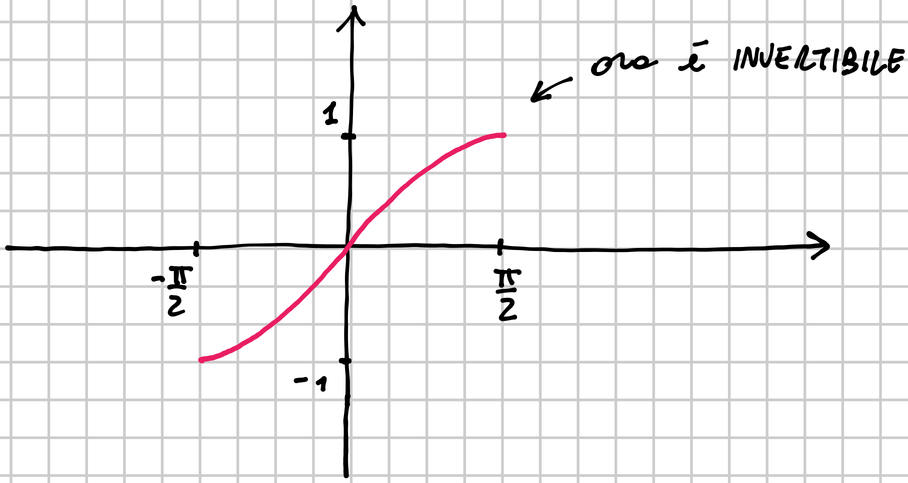


$\forall y\in[-1,1]$ esistono infiniti $x\in\mathbb{R}$ tali che $f(x)=y$, cioè tali che $\sin x = y$

y_0 ha infinite controimmagini: $x_1, x_2, x_3, \dots$

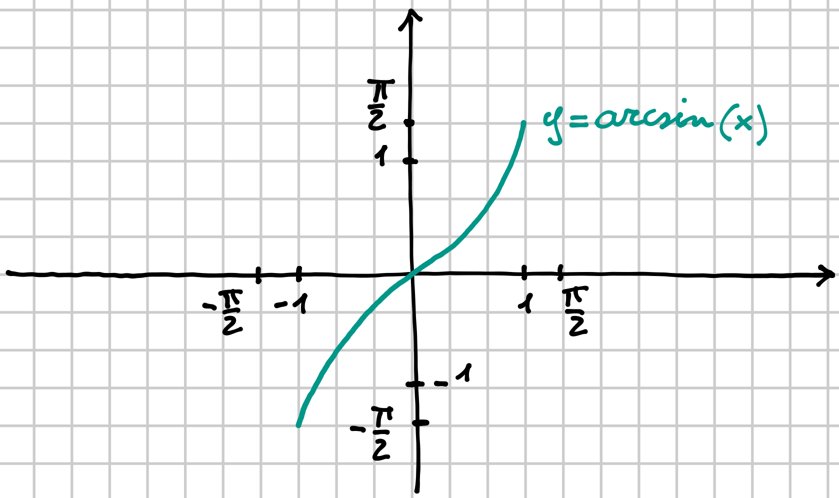
f NON È INIETTIVA, DUNQUE NON È INVERTIBILE

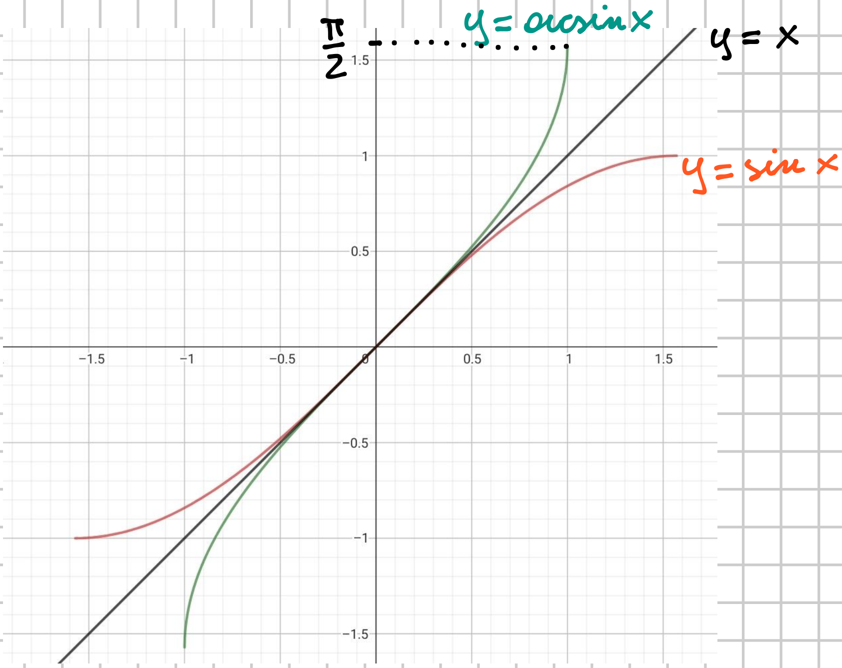
Considero la RESTRIZIONE di $\sin x$ all'intervallo $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$



La funzione inversa della restrizione di $\sin x$ a $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ si chiama ARCOSENO $\quad \arcsin(x)$

$$\arcsin : [-1, 1] \longrightarrow \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$





521 $\cos\left[\arcsin\left(-\frac{\sqrt{3}}{2}\right)\right]$ $\left[\frac{1}{2}\right]$

$\arcsin\left(-\frac{\sqrt{3}}{2}\right) =$ angolo $\in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ il cui seno è $-\frac{\sqrt{3}}{2}$

$= -\frac{\pi}{3}$ $\quad \left(\arcsin\left(-\frac{\sqrt{3}}{2}\right) = -\arcsin\left(\frac{\sqrt{3}}{2}\right) = -\frac{\pi}{3}\right)$

$$\cos\left[\arcsin\left(-\frac{\sqrt{3}}{2}\right)\right] = \cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$$