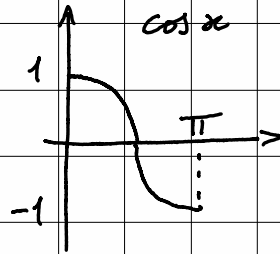


Funzioni trigonometriche inverse

$$f(x) = \cos x$$



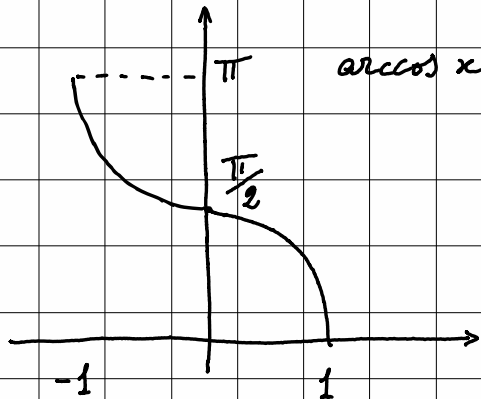
$f: \mathbb{R} \rightarrow \mathbb{R}$ è pari e periodica

Vista come $f: [0, \pi] \rightarrow [-1, 1]$

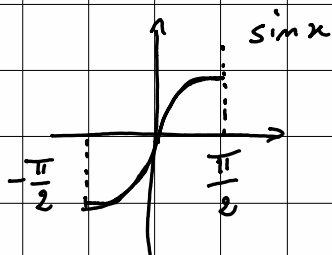
è strettamente decrescente e invertibile

f ' inversa è $g: [-1, 1] \rightarrow [0, \pi]$

$$g(x) = \arccos x$$



$$f(x) = \sin x$$



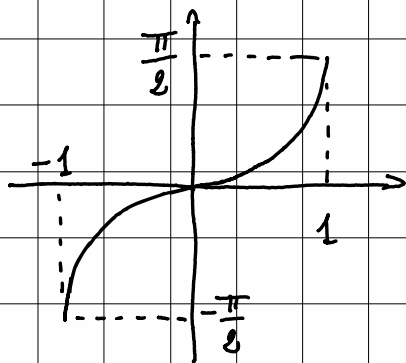
$f: \mathbb{R} \rightarrow \mathbb{R}$ è dispari e periodica

Vista come $f: [-\frac{\pi}{2}, \frac{\pi}{2}] \rightarrow [-1, 1]$

è strettamente crescente e invertibile

l'inversa è $g: [-1, 1] \rightarrow [-\frac{\pi}{2}, \frac{\pi}{2}]$

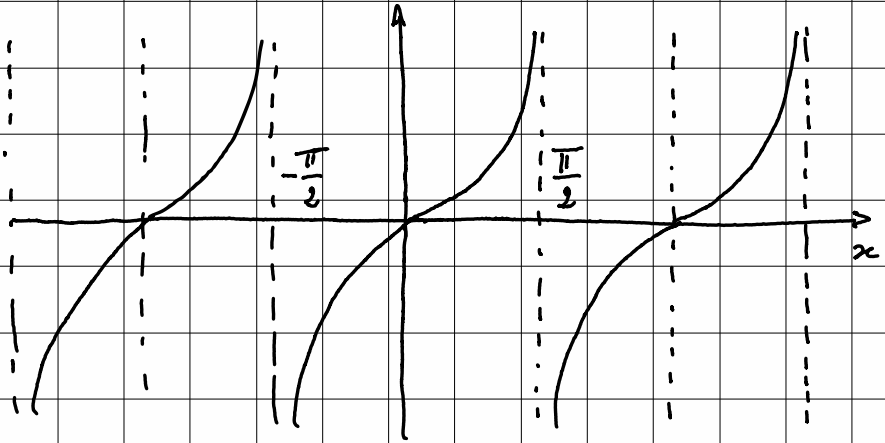
$$g(x) = \arcsin x$$



$$f(x) = \tan x$$

Definita su $A = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi : k \in \mathbb{Z} \right\}$

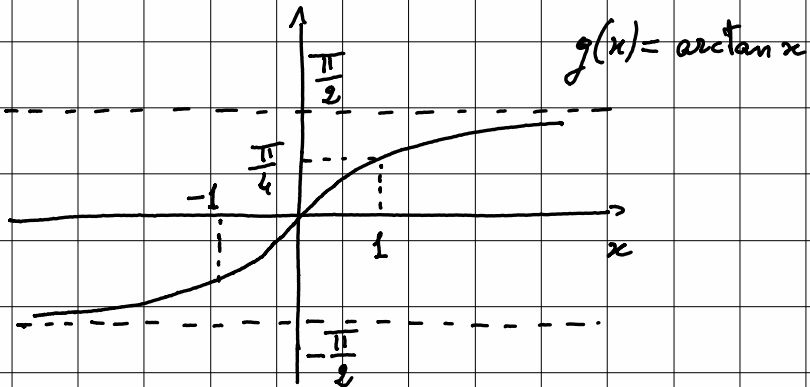
Vista come $f: A \rightarrow \mathbb{R}$ è dispari e periodica, inoltre è surgettiva ma non iniettiva.



Vista come $f: \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \rightarrow \mathbb{R}$

è strettamente crescente e invertibile.

L'inversa è $g: \mathbb{R} \rightarrow \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$



$$1) \sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$$

$$2) \cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$$

Dalla 1) segue

$$\sin\left(x \pm \frac{\pi}{2}\right) = \sin x \cos \frac{\pi}{2} \pm \cos x \sin \frac{\pi}{2} = \pm \cos x$$

$$\sin 2x = \sin(x+x) = \sin x \cos x + \cos x \sin x = 2 \sin x \cos x$$

Dalla 2) segue

$$\cos 2x = \cos(x+x) = \cos x \cos x - \sin x \sin x = \cos^2 x - \sin^2 x$$

Formula di Werner.

$$\cos \alpha \cos \beta = \frac{1}{2} [\cos(\alpha + \beta) + \cos(\alpha - \beta)]$$

$$\sin \alpha \sin \beta = \frac{1}{2} [\sin(\alpha + \beta) - \sin(\alpha - \beta)]$$

$$\text{da cui: } \cos(\omega t + \varphi) \cos \omega t = \frac{1}{2} [\cos(2\omega t + \varphi) + \cos \varphi]$$

