

# RIEPILOGO GRAFICI

$$y = \sin x$$

$$\text{DOMINIO} = \mathbb{R}$$

↑  
dove varia  
la x

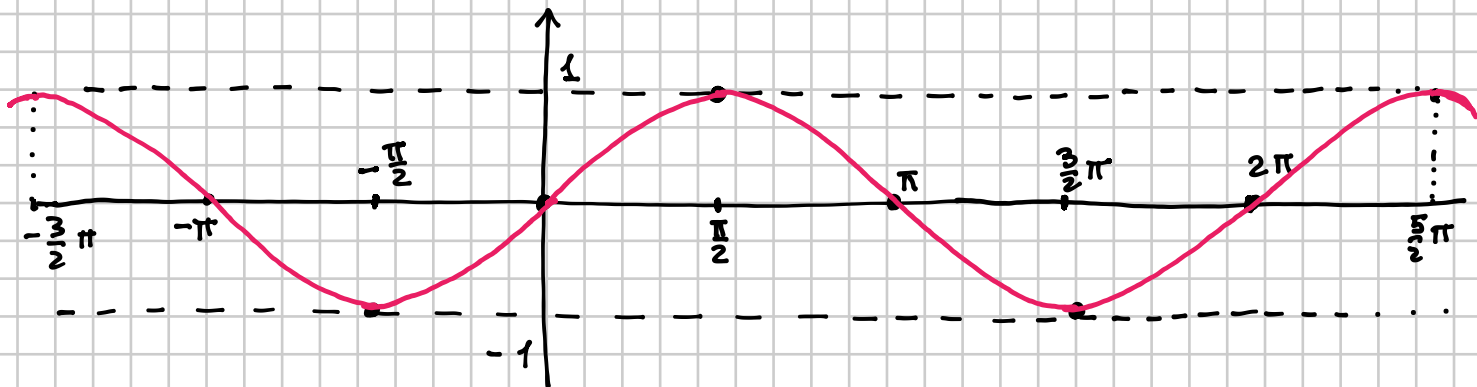
$$\text{INSIEME IMMAGINE} = [-1, 1]$$

↑  
dove varia la y

DISPARI e PERIODICA DI PERIODO  $2\pi$

↓  
 $\sin(-x) = -\sin x$

↓  
 $\forall x \in \mathbb{R} \quad \sin(x + 2k\pi) = \sin x \quad (k \in \mathbb{Z})$



x è lo stesso angolo in RADIANTI

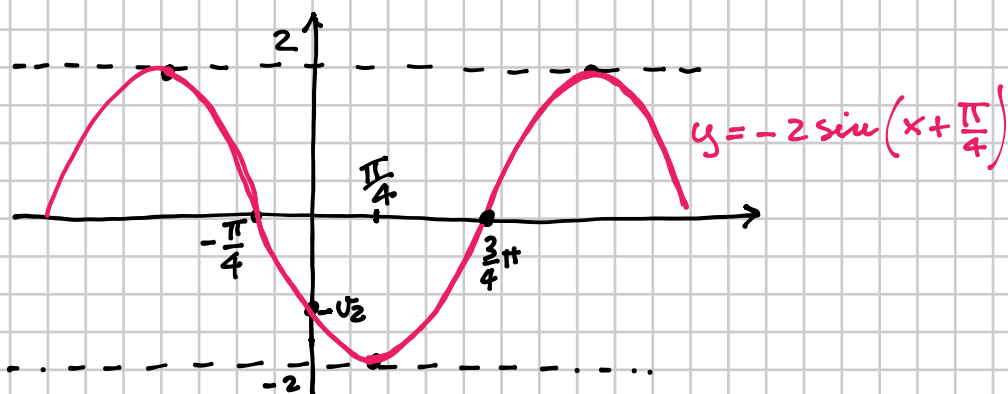
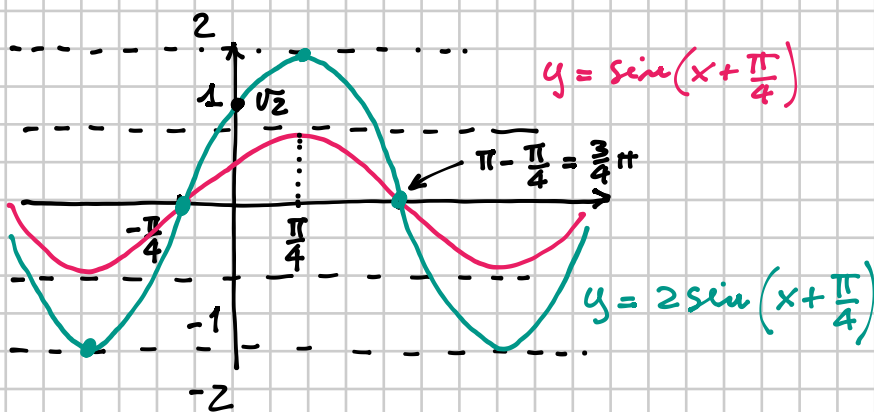
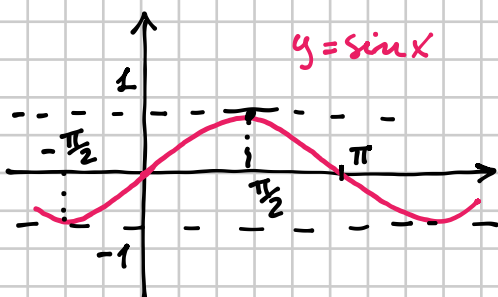
DISEGNARE IL GRAFICO

609

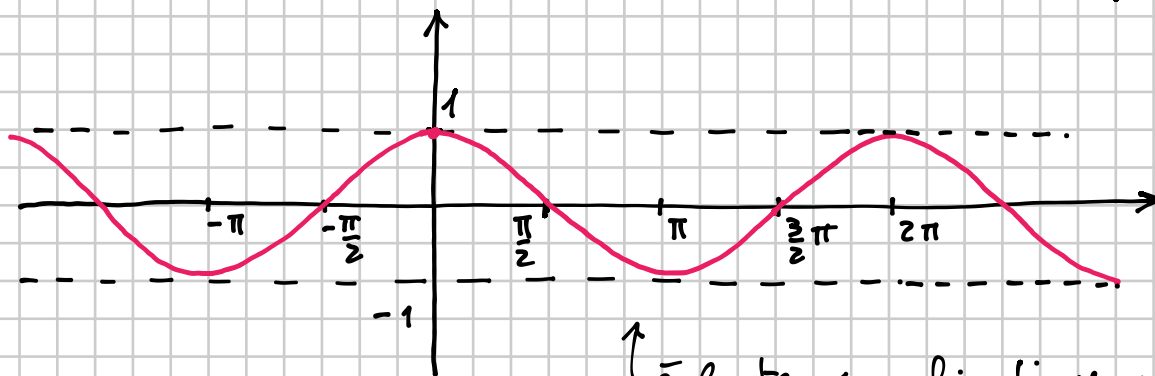
$$y = -2 \sin\left(x + \frac{\pi}{4}\right)$$

$$y = \sin x \rightarrow y = \sin\left(x + \frac{\pi}{4}\right) \rightarrow$$

$$\rightarrow y = 2 \sin\left(x + \frac{\pi}{4}\right) \rightarrow y = -2 \sin\left(x + \frac{\pi}{4}\right)$$



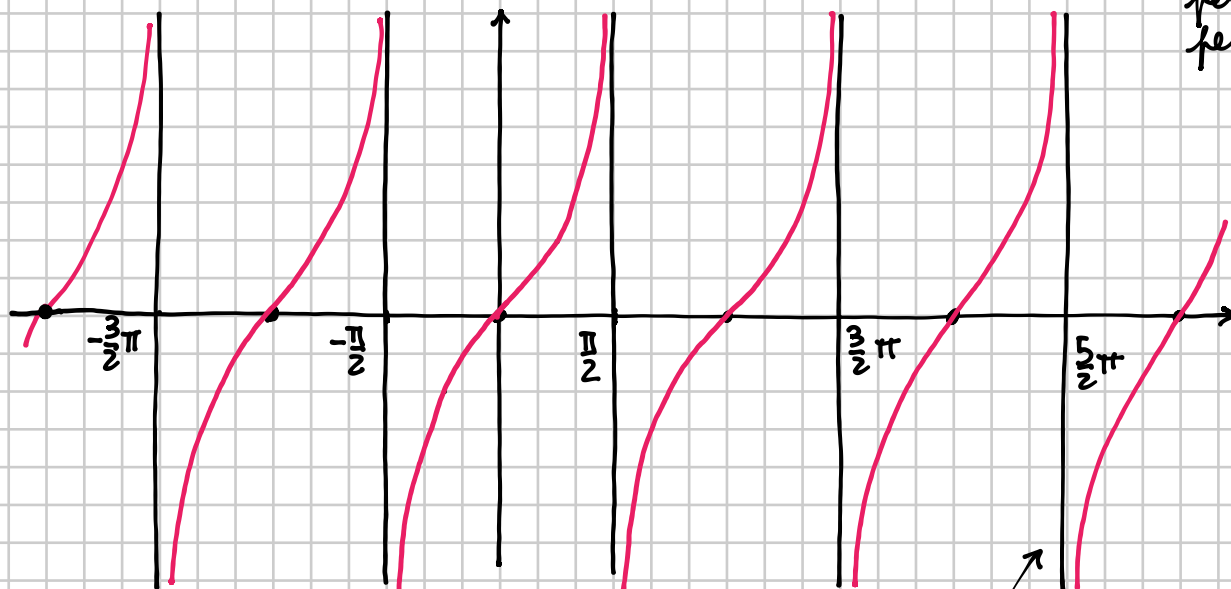
$y = \cos(x)$      $\text{dom} = \mathbb{R}$      $\text{Im} = [-1, 1]$     periodica di periodo  $2\pi$



↑  
è lo stesso grafico di  $y = \sin x$   
traslato verso sinistra di  $\frac{\pi}{2}$ .

Infatti:  
 $\cos(x) = \sin\left(x + \frac{\pi}{2}\right)$

$y = \tan x$      $\text{dom} = \left\{x \in \mathbb{R} \mid x \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z}\right\}$      $\text{Im} = \mathbb{R}$



periodica di  
periodo  $\pi$

TANGENTE

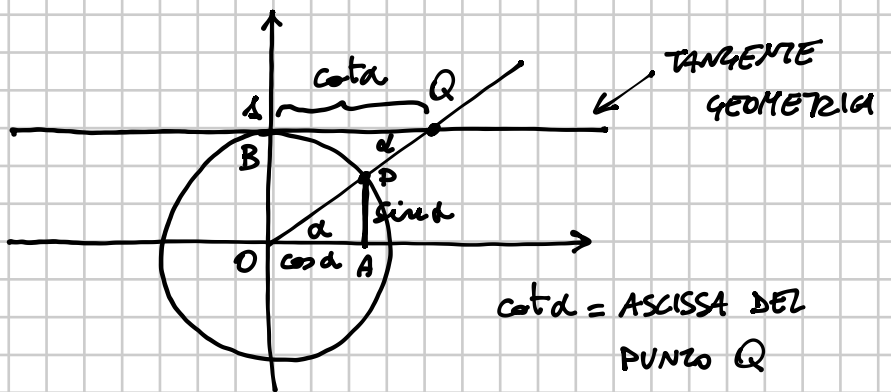
ASINTOTI  $y = \frac{\pi}{2} + k\pi$

non fanno parte del grafico!

## COTANGENTE

$$\cot x = \frac{\cos x}{\sin x}$$

$$x \neq k\pi$$



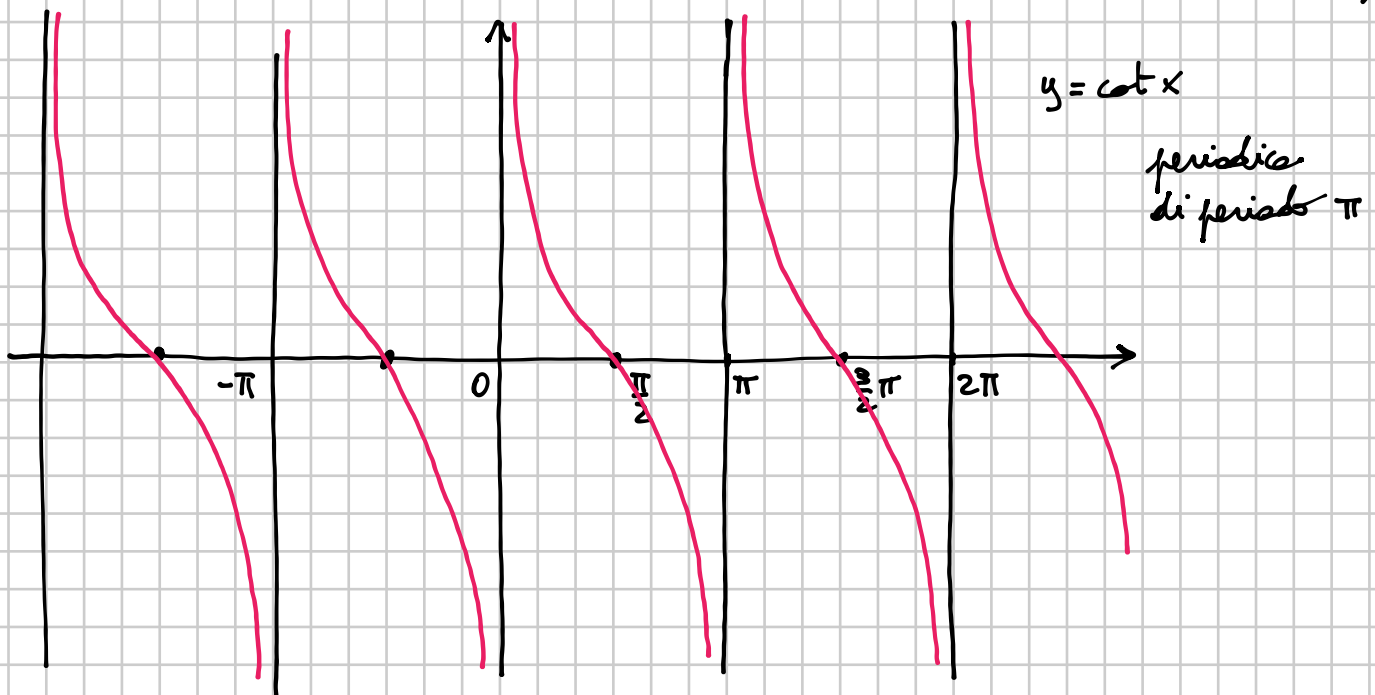
$OAP$  è simile a  $OQB$

$$\overline{BQ} : \overline{BO} = \overline{OA} : \overline{AP}$$

$$\cot \alpha : 1 = \cos \alpha : \sin \alpha \Rightarrow \cot \alpha = \frac{\cos \alpha}{\sin \alpha}$$

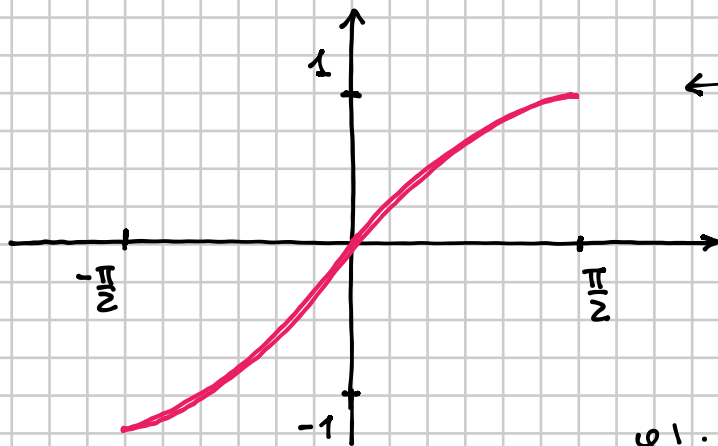
Dalle formule degli angoli associati:  $\cot x = \tan\left(\frac{\pi}{2} - x\right)$

Per costruire il grafico passo passo:  $\tan x \rightarrow \tan(-x) \rightarrow \tan\left(-\left(x - \frac{\pi}{2}\right)\right)$



$y = \sin x$  NON è invertibile perché non è iniettiva

Allora considero la RESTRIZIONE di  $\sin x$  tra  $-\frac{\pi}{2}$  e  $\frac{\pi}{2}$  (all'intervallo  $[-\frac{\pi}{2}, \frac{\pi}{2}]$ )

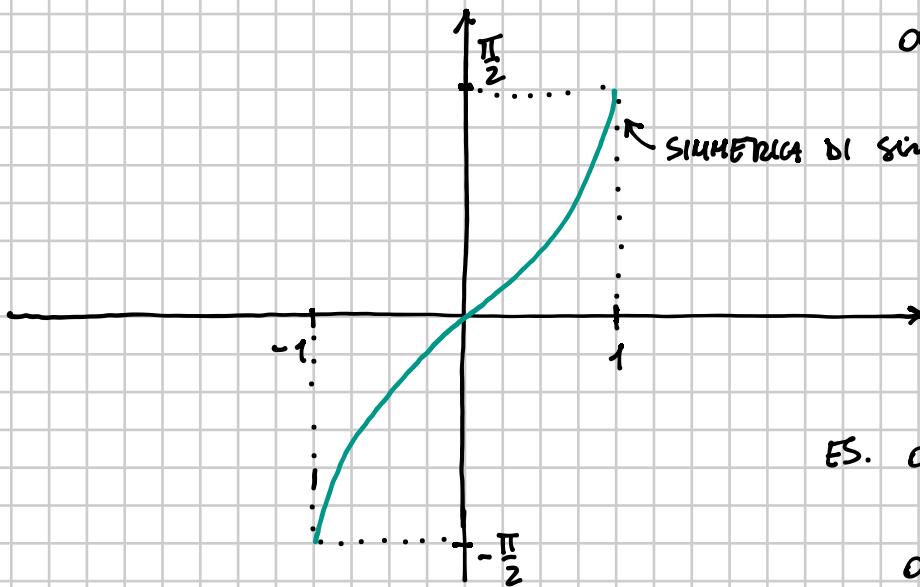


ora  
← è invertibile

$$\sin : [-\frac{\pi}{2}, \frac{\pi}{2}] \rightarrow [-1, 1]$$

L'inversa è la funzione ARCOSENO

$$\arcsin : [-1, 1] \rightarrow [-\frac{\pi}{2}, \frac{\pi}{2}]$$



← SIMMETRICA DI  $\sin x$  rispetto alla bisettrice I-III  
 $y = x$  QUADR.

$$\text{ES. } \arcsin\left(\frac{\sqrt{2}}{2}\right) = \frac{\pi}{4}$$

$$\arcsin(-1) = -\frac{\pi}{2}$$

$$\arcsin(0) = 0$$

$$\arcsin\left(\frac{1}{2}\right) = \frac{\pi}{6}$$

$$\arcsin\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$$

È una funzione DISPARI

$$\arcsin(-x) = -\arcsin x$$