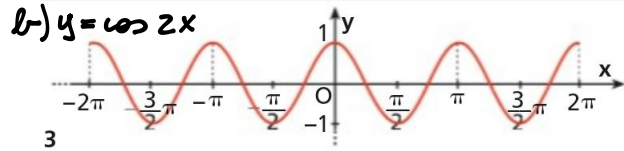
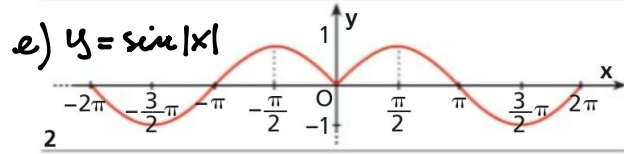
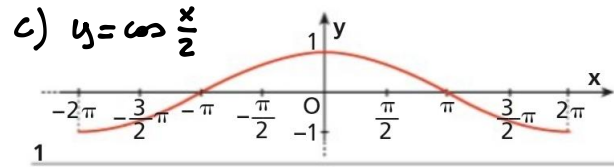


**694** ASSOCIA a ogni grafico la corrispondente funzione scelta fra le seguenti.

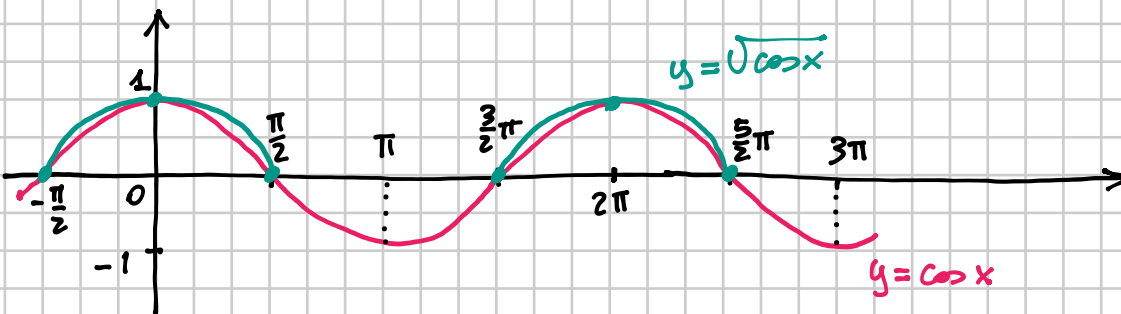
- a.  $y = \sin 2x$
- b.  $y = \cos 2x$
- c.  $y = \cos \frac{x}{2}$
- d.  $y = \cos |x|$
- e.  $y = \sin |x|$



**699**  $y = 2\sqrt{\cos x} - 1$

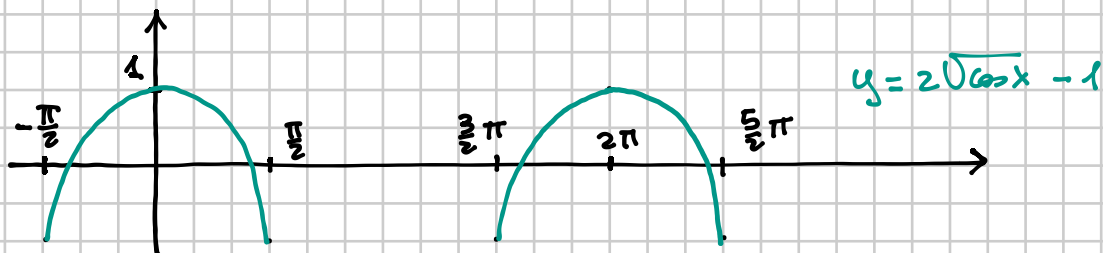
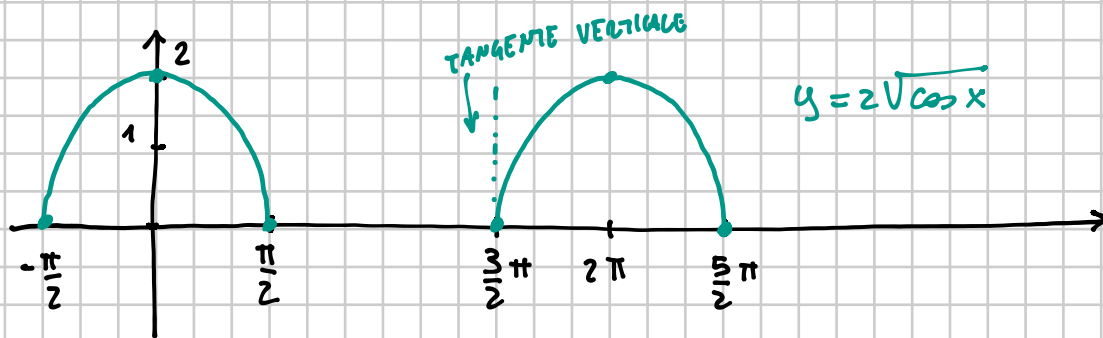
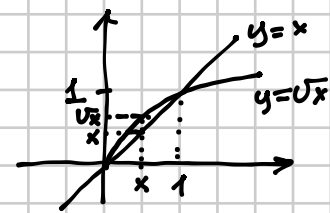
DISEGNARE IL GRAFICO

$$\cos x \rightarrow \sqrt{\cos x} \rightarrow 2\sqrt{\cos x} \rightarrow 2\sqrt{\cos x} - 1$$



Se  $0 < x < 1$

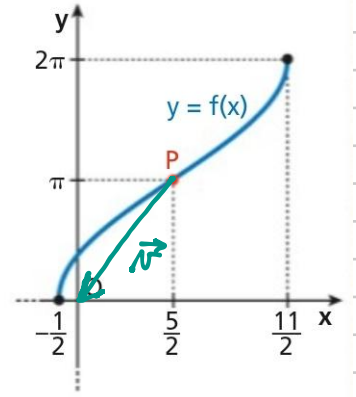
si ha che  $\sqrt{x} > x$



Nel grafico è rappresentata la funzione

$$f(x) = a + b \arcsin[c(x+d)], \text{ con } b, c > 0.$$

- Individua dominio e insieme immagine di  $f$  e deduci i valori dei parametri  $a$ ,  $b$ ,  $c$  e  $d$ .
- Esegui una traslazione in modo che il grafico della funzione  $g(x)$  ottenuta abbia centro di simmetria nell'origine.
- Traccia il grafico della funzione  $\frac{1}{g(x)}$ .
- Trova l'equazione della funzione  $g^{-1}(x)$  e disegna il suo grafico.



$$\left[ \text{a) } a = \pi, b = 2, c = \frac{1}{3}, d = -\frac{5}{2}; \text{ b) } g(x) = 2 \arcsin \frac{x}{3}; \text{ d) } g^{-1}(x) = 3 \sin \frac{x}{2} \right]$$

$$\text{a) } \text{dom } f = \left[-\frac{1}{2}, \frac{11}{2}\right] \quad \text{im } f = [0, 2\pi]$$

Punti di flesso del grafico  $(-\frac{1}{2}, 0)$   $P(\frac{5}{2}, \pi)$   $(\frac{11}{2}, 2\pi)$

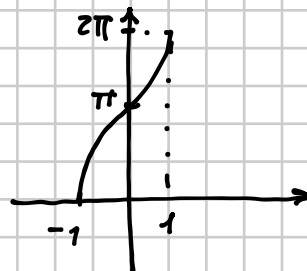
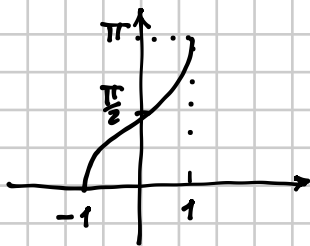
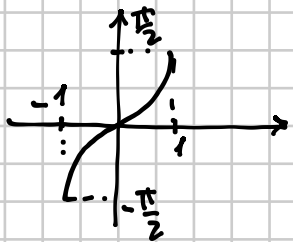
$$\left. \begin{aligned} (-\frac{1}{2}, 0) &\Rightarrow a + b \arcsin\left[c\left(-\frac{1}{2} + d\right)\right] = 0 \\ P(\frac{5}{2}, \pi) &\Rightarrow a + b \arcsin\left[c\left(\frac{5}{2} + d\right)\right] = \pi \\ (\frac{11}{2}, 2\pi) &\Rightarrow a + b \arcsin\left[c\left(\frac{11}{2} + d\right)\right] = 2\pi \end{aligned} \right\} \text{NON RISOLVIBILE}$$

Quindi bisogna osservare il grafico e partendo da  $y = \arcsin x$  ottenerlo tramite trasformazioni elementari

$$y = \arcsin x$$

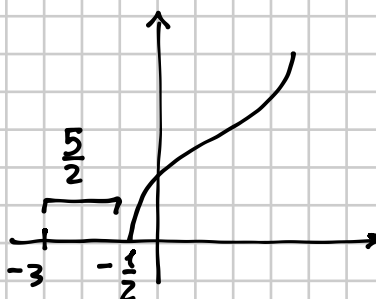
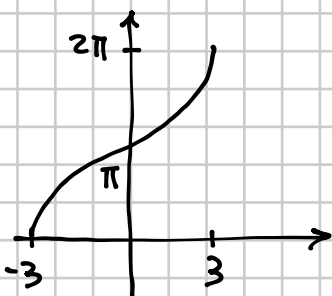
$$y = \arcsin x + \frac{\pi}{2}$$

$$y = 2\left(\arcsin x + \frac{\pi}{2}\right) = 2 \arcsin x + \pi$$



$$y = 2 \arcsin\left(\frac{x}{3}\right) + \pi$$

$$y = 2 \arcsin\left(\frac{1}{3}\left(x - \frac{5}{2}\right)\right) + \pi$$

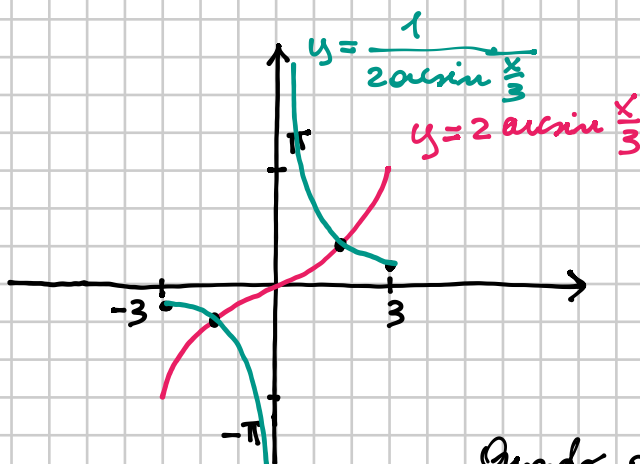


$$\begin{aligned} \hookrightarrow a &= \pi \\ b &= 2 \\ c &= \frac{1}{3} \\ d &= -\frac{5}{2} \end{aligned}$$

b) La traslazione di vettore  $\vec{r}(-\frac{5}{2}, -\pi)$  trasforma la funzione in

$$g(x) = 2 \arcsin \frac{x}{3}$$

c)



$$\rightarrow y = \frac{1}{2 \arcsin \frac{x}{3}}$$

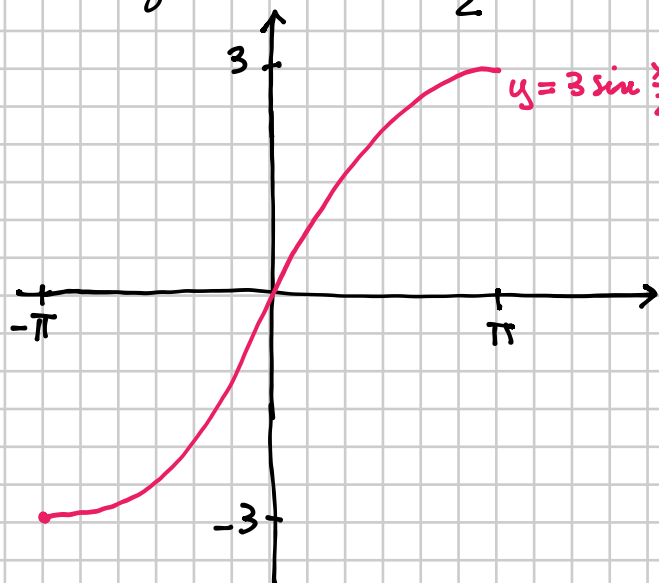
dove la funzione vale  $-1$  o  $1$ , il reciproco è  $\arcsin -1$  e  $1$

Quando  $g(x)$  si avvicina a  $0$ ,  $\frac{1}{g(x)}$  va a  $\infty$  (mantenendo positività o negatività)

d)  $g(x) = 2 \arcsin \frac{x}{3}$       $g: [-3, 3] \rightarrow [-\pi, \pi]$

$$g^{-1}: [-\pi, \pi] \rightarrow [-3, 3]$$

$$g^{-1}(x) = 3 \sin \frac{x}{2}$$



$$y = 2 \arcsin \frac{x}{3}$$

$$\frac{y}{2} = \arcsin \frac{x}{3}$$

$$\frac{x}{3} = \sin\left(\frac{y}{2}\right)$$

$$x = 3 \sin \frac{y}{2}$$

$$y = 3 \sin \frac{x}{2}$$

(SCAMBIO X E Y)