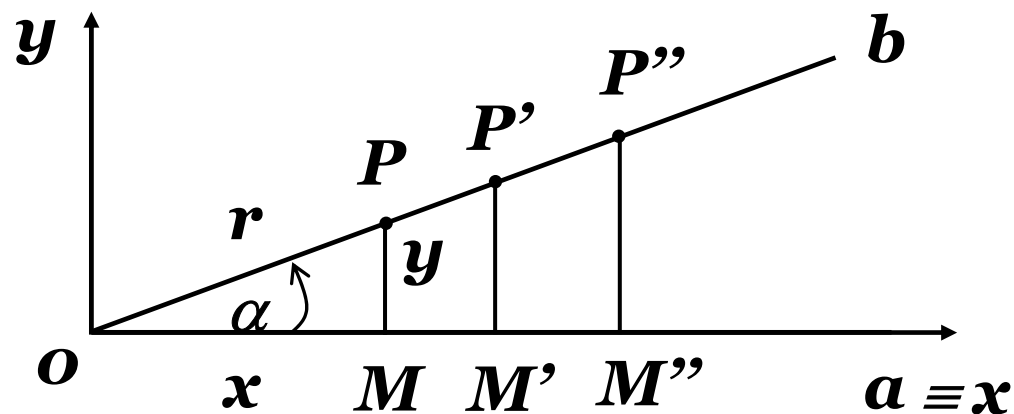


Cenni di trigonometria - Funzioni circolari dell'angolo



$$\alpha = \hat{a}b$$

I rapporti: $\frac{y}{r}$ $\frac{x}{r}$ $\frac{y}{x}$

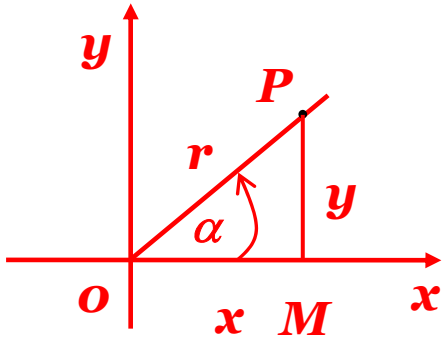
*non dipendono dalla scelta di P sulla semiretta b ,
ma sono funzioni dell'angolo α .*

$$\text{sen } \alpha = \frac{y}{r} \qquad \text{cos } \alpha = \frac{x}{r} \qquad \text{tg } \alpha = \frac{y}{x}$$

$$\text{sen}^2 \alpha + \text{cos}^2 \alpha = \frac{y^2}{r^2} + \frac{x^2}{r^2} = \frac{y^2 + x^2}{r^2} = \frac{r^2}{r^2} = 1$$

funzione seno

$$\text{sen } \alpha = \frac{y}{r}$$

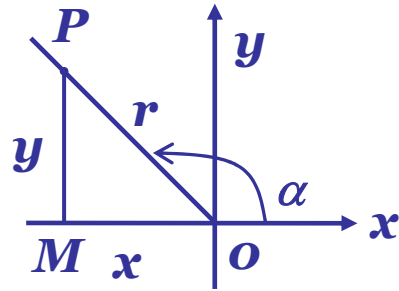


$$\text{sen } 0 = 0$$

$$\text{sen } \frac{\pi}{2} = 1$$

$$0 \leq \alpha \leq \frac{\pi}{2}$$

$$0 \leq \text{sen } \alpha \leq 1$$

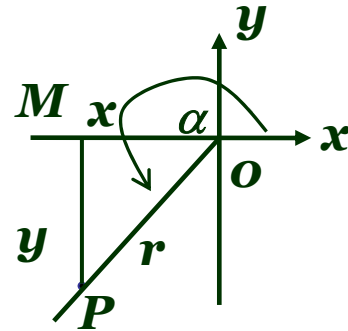


$$\text{sen } \frac{\pi}{2} = 1$$

$$\text{sen } \pi = 0$$

$$\frac{\pi}{2} \leq \alpha \leq \pi$$

$$1 \geq \text{sen } \alpha \geq 0$$

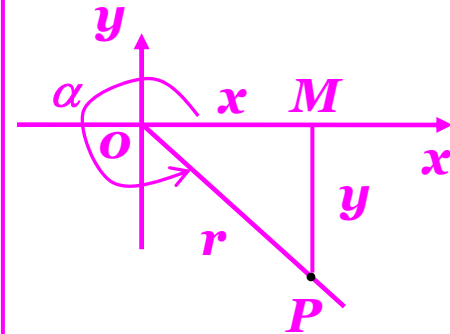


$$\text{sen } \pi = 0$$

$$\text{sen } \frac{3}{2} \pi = -1$$

$$\pi \leq \alpha \leq \frac{3\pi}{2}$$

$$0 \geq \text{sen } \alpha \geq -1$$



$$\text{sen } \frac{3}{2} \pi = -1$$

$$\text{sen } 2\pi = 0$$

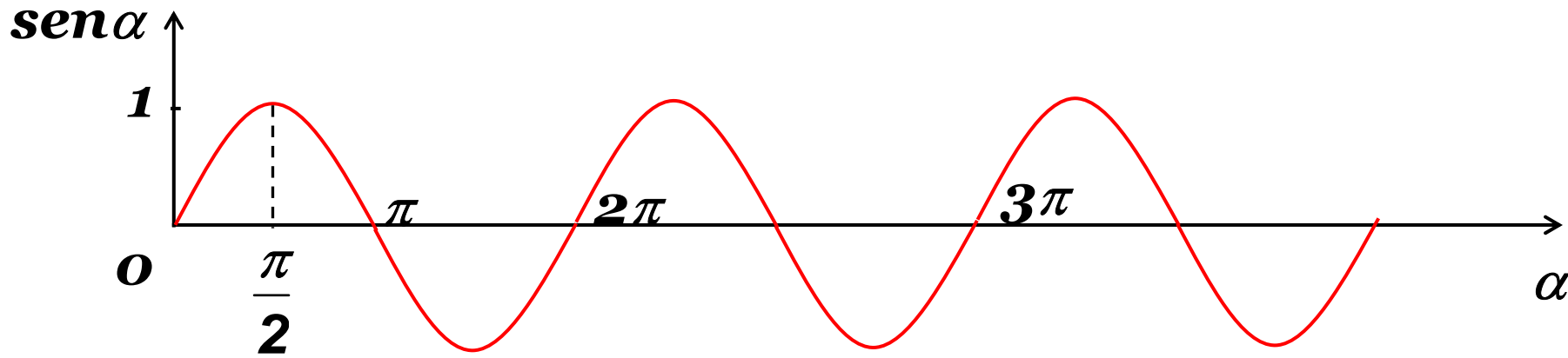
$$\frac{3\pi}{2} \leq \alpha \leq 2\pi$$

$$-1 \leq \text{sen } \alpha \leq 0$$

$(0 < \alpha < \pi)$ seno positivo

$(\pi < \alpha < 2\pi)$ seno negativo

profilo del seno

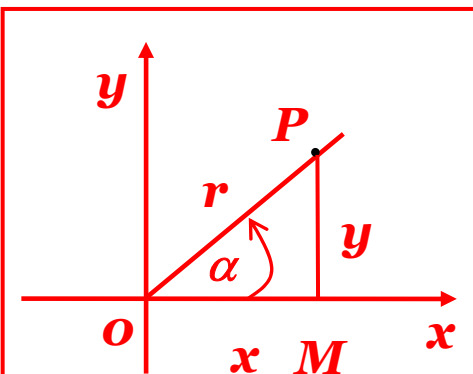


$$\text{sen}(\alpha \pm 2K\pi) = \text{sen } \alpha$$

Il seno di un angolo è una funzione periodica con periodo 2π .

funzione coseno

$$\cos \alpha = \frac{x}{r}$$

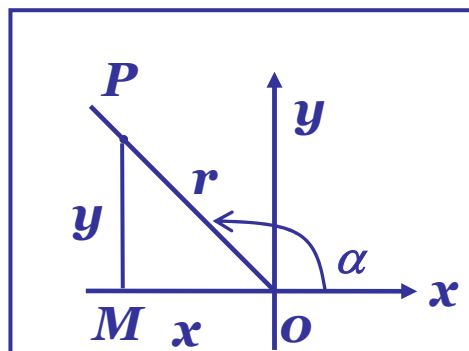


$$\cos 0 = 1$$

$$\cos \frac{\pi}{2} = 0$$

$$0 \leq \alpha \leq \frac{\pi}{2}$$

$$1 \geq \cos \alpha \geq 0$$

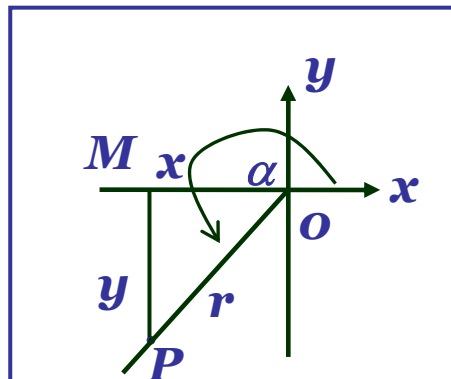


$$\cos \frac{\pi}{2} = 0$$

$$\cos \pi = -1$$

$$\frac{\pi}{2} \leq \alpha \leq \pi$$

$$0 \geq \cos \alpha \geq -1$$

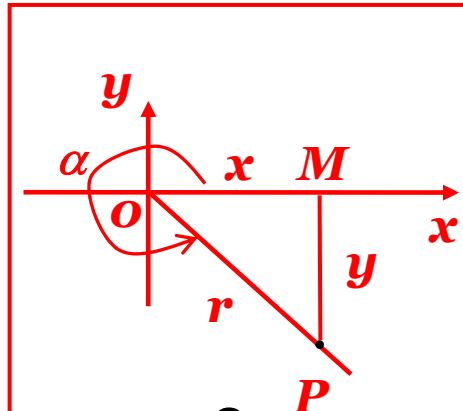


$$\cos \pi = -1$$

$$\cos \frac{3}{2} \pi = 0$$

$$\pi \leq \alpha \leq \frac{3\pi}{2}$$

$$-1 \leq \cos \alpha \leq 0$$



$$\cos \frac{3}{2} \pi = 0$$

$$\cos 2\pi = 1$$

$$\frac{3\pi}{2} \leq \alpha \leq 2\pi$$

$$0 \leq \cos \alpha \leq 1$$

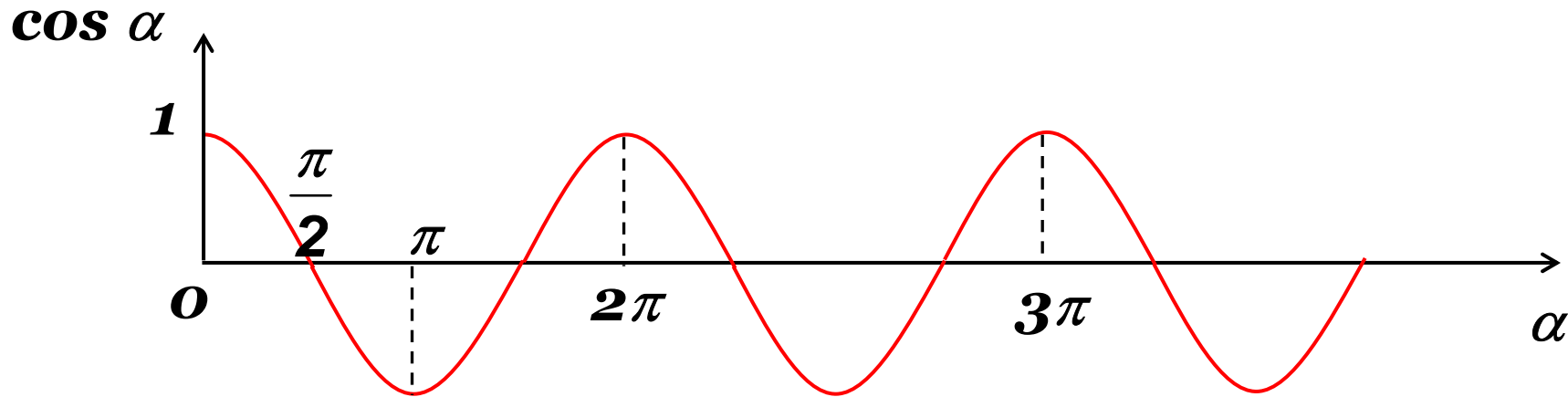
positivo

negativo

negativo

positivo

profilo del coseno

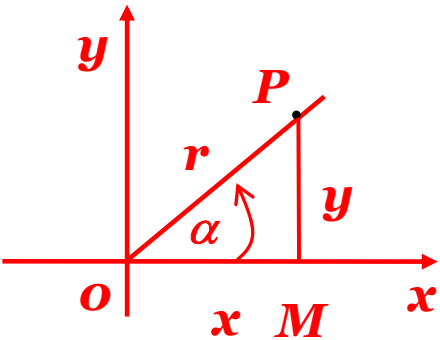


$$\cos(\alpha \pm 2K\pi) = \cos \alpha$$

Il coseno di un angolo è una funzione periodica con periodo 2π .

funzione tangente

$$\operatorname{tg} \alpha = \frac{y}{x} = \frac{\operatorname{sen} \alpha}{\operatorname{cos} \alpha}$$

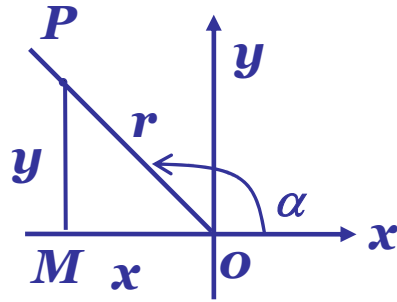


$$\operatorname{tg} 0 = 0$$

$$\operatorname{tg} \frac{\pi}{2} \text{ non def}$$

$$0 \leq \alpha < \frac{\pi}{2}$$

tg α è
positiva e
crescente

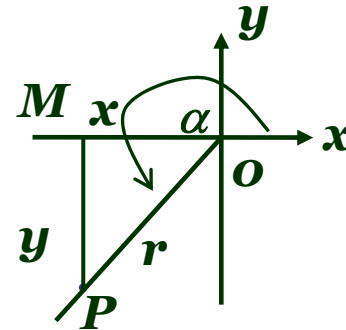


$$\operatorname{tg} \frac{\pi}{2} \text{ non def}$$

$$\operatorname{tg} \pi = 0$$

$$\frac{\pi}{2} < \alpha \leq \pi$$

tg α è
negativa e
crescente

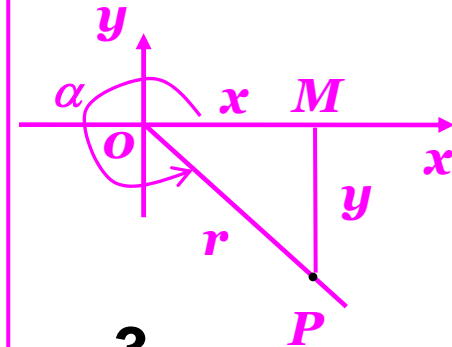


$$\operatorname{tg} \pi = 0$$

$$\operatorname{tg} \frac{3}{2} \pi \text{ non def}$$

$$\pi \leq \alpha < \frac{3\pi}{2}$$

tg α è
positiva e
crescente



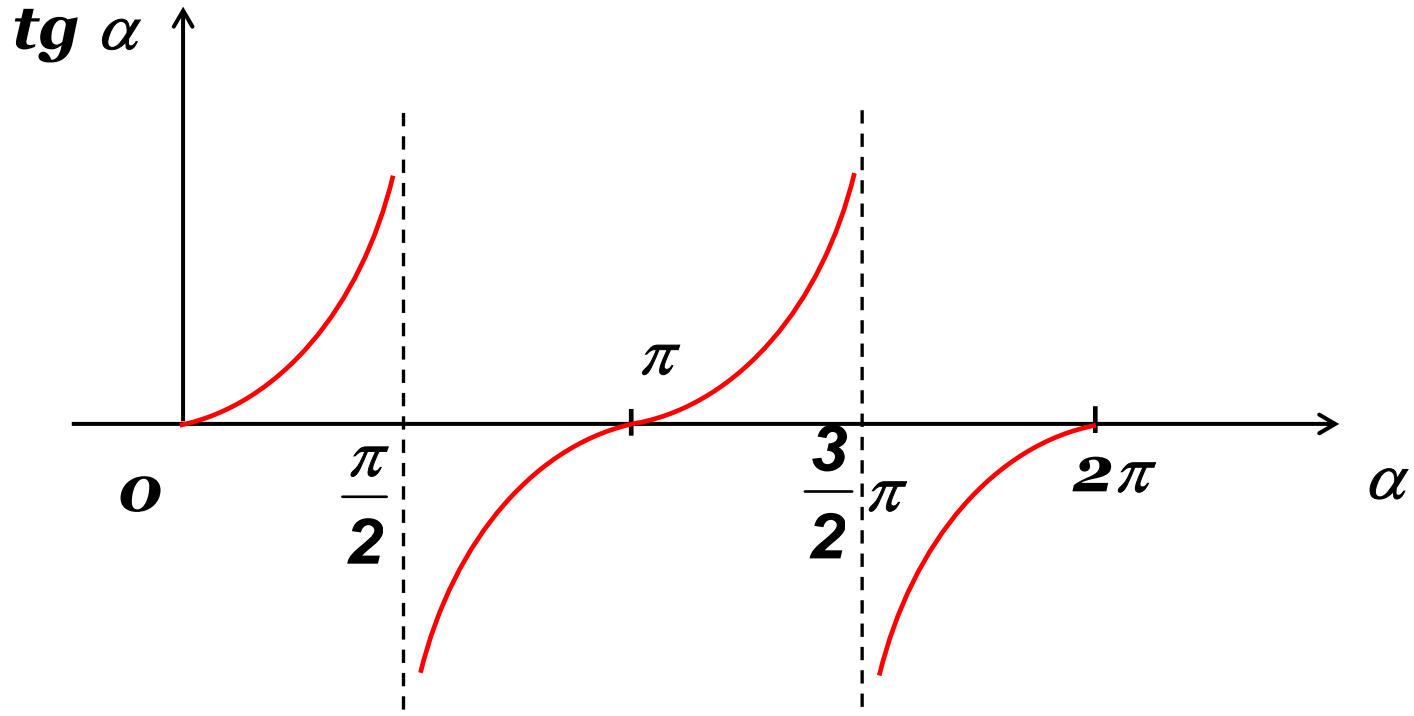
$$\operatorname{tg} \frac{3}{2} \pi \text{ non def}$$

$$\operatorname{tg} 2\pi = 0$$

$$\frac{3\pi}{2} < \alpha \leq 2\pi$$

tg α è
negativa e
crescente

profilo della tangente



La funzione tangente ha due asintoti paralleli all'asse y . E' periodica con periodo π .

$$\text{tg}(\alpha \pm K\pi) = \text{tg}\alpha$$