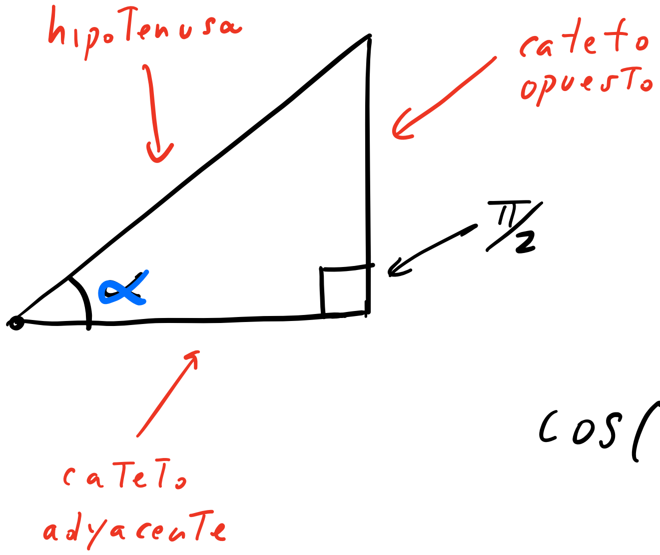
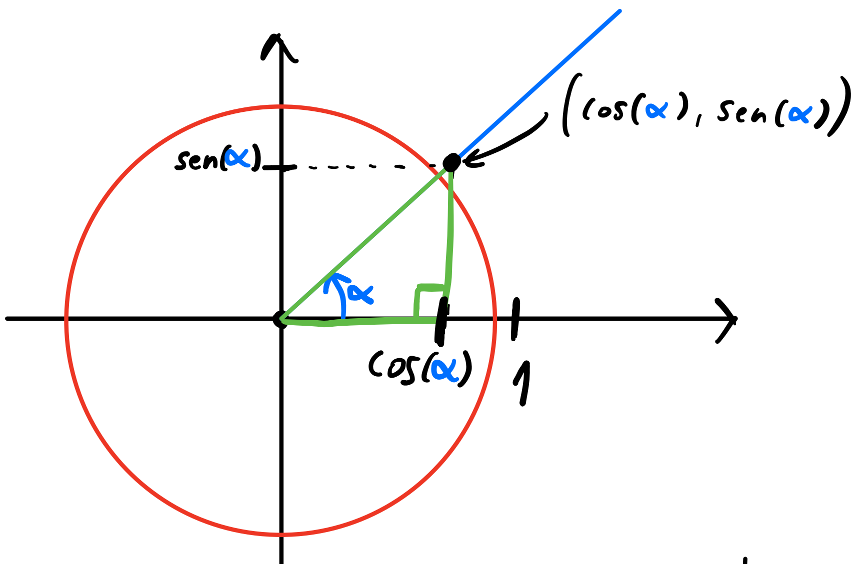


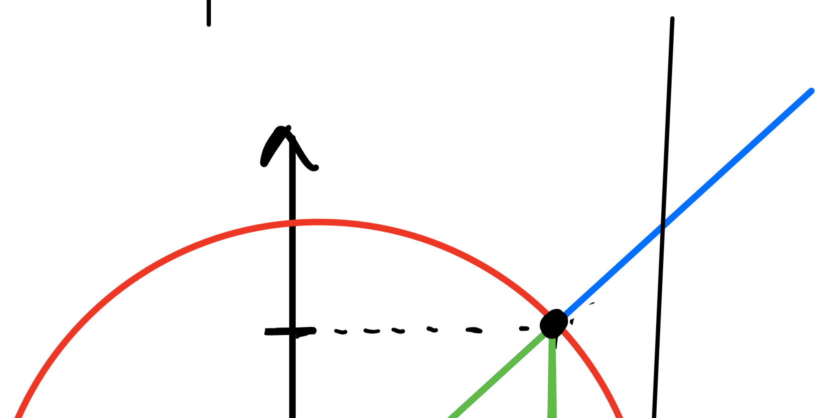
$$\cos(\alpha) = \frac{\text{cateto adyacente}}{\text{hipotenusa}}$$

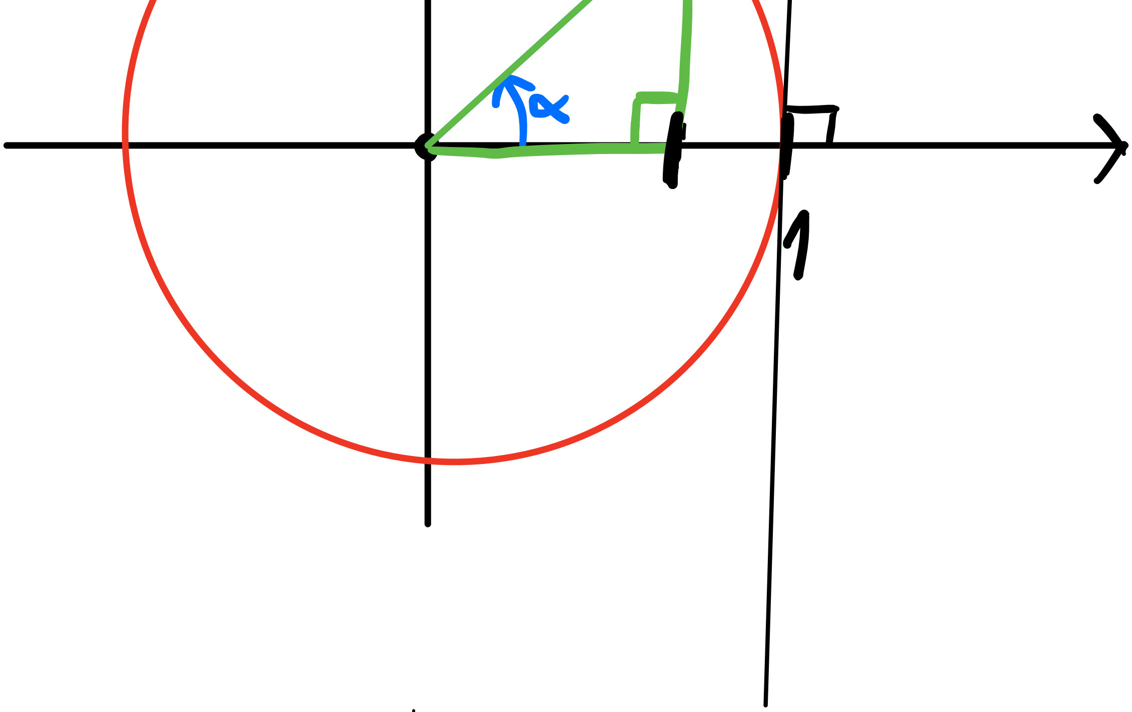
$$\operatorname{sen}(\alpha) = \frac{\text{cateto opuesto}}{\text{hipotenusa}}$$

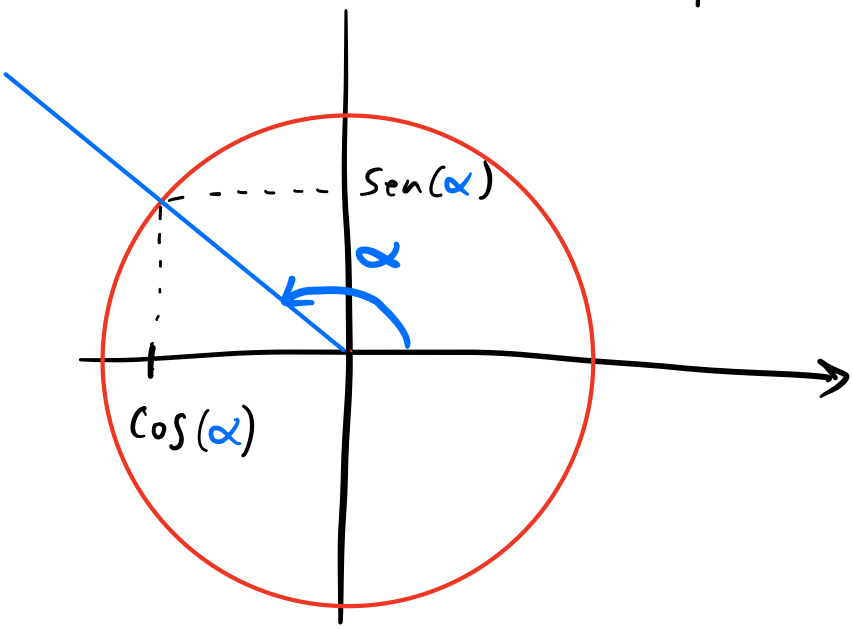
$$\operatorname{tg}(\alpha) = \frac{\text{cateto opuesto}}{\text{cateto adyacenta}} = \frac{\operatorname{sen}(\alpha)}{\cos(\alpha)}$$

CÍRCULO TRIGONOMÉTRICO

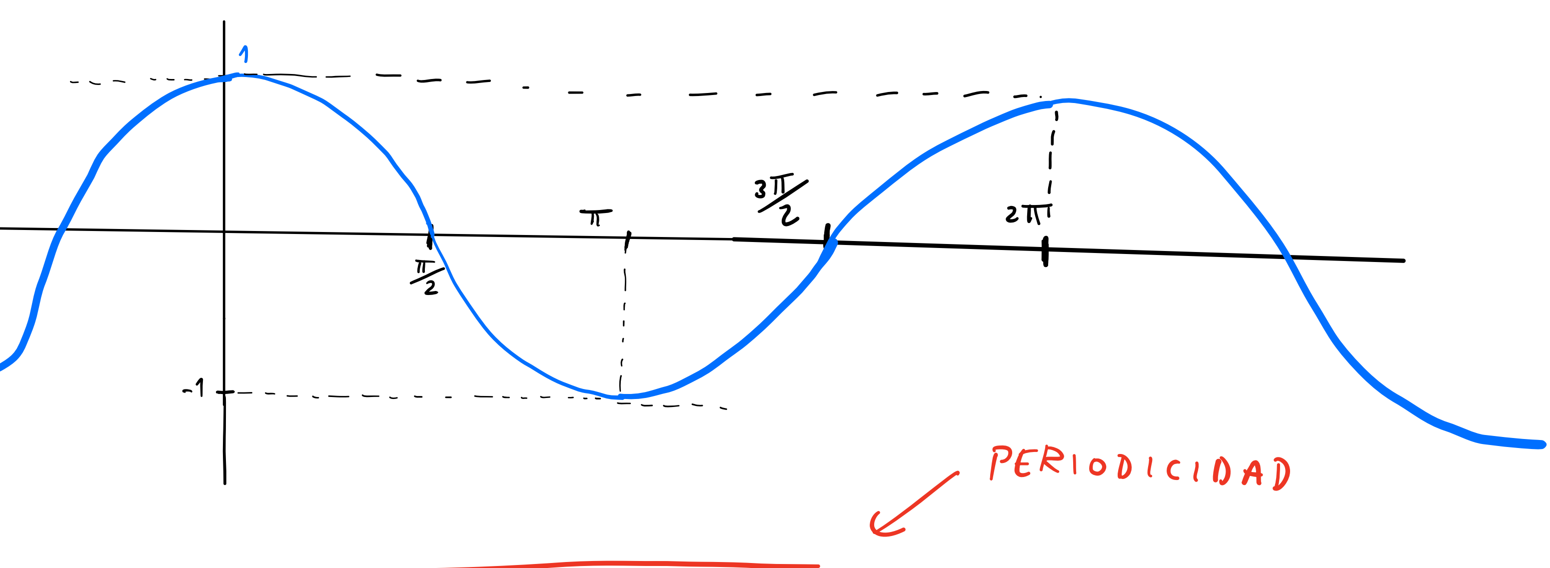






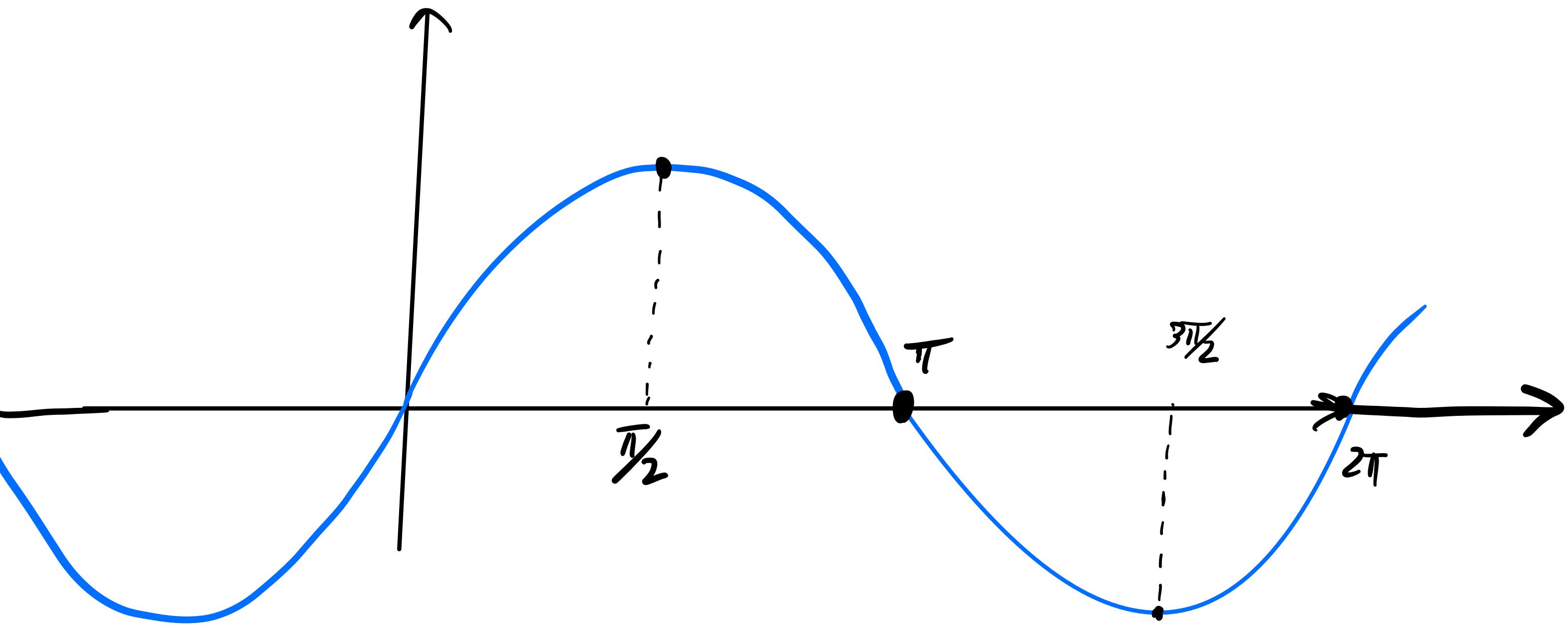


La función cos(α)



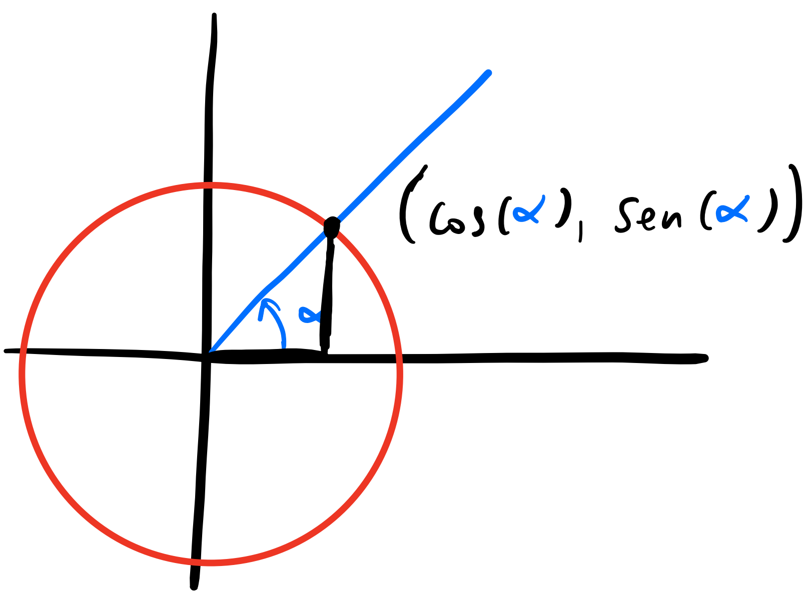
$$\boxed{\cos(\alpha + 2\pi) = \cos(\alpha)} \quad \forall \alpha \in \mathbb{R}$$

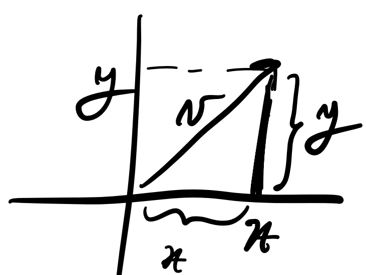
EJERCICIO: Pensar y hacer el gráfico de la función $\operatorname{sen}(\alpha)$



$$\boxed{\operatorname{sen}(\alpha + 2\pi) = \operatorname{sen}(\alpha)} \quad \forall \alpha \in \mathbb{R}$$

PERIODICIDAD





$$|v| = \sqrt{x^2 + y^2}$$

$$\boxed{\cos(\alpha)^2 + \operatorname{sen}(\alpha)^2 = 1}$$

$$\boxed{\cos(\alpha) = \cos(-\alpha) \quad \forall \alpha \in \mathbb{R}}$$

coseno es función par

$$\boxed{\operatorname{sen}(-\alpha) = -\operatorname{sen}(\alpha) \quad \forall \alpha \in \mathbb{R}}$$

seno es función impar

Más sobre la periodicidad

$$\operatorname{sen}(\alpha + 2\pi) = \operatorname{sen}(\alpha)$$

$$\underbrace{\operatorname{sen}((\alpha+2\pi) + 2\pi)}_{=\ \operatorname{sen}(\alpha + 2.2\pi)} = \operatorname{sen}((\alpha + 2\pi)) = \operatorname{sen}(\alpha)$$

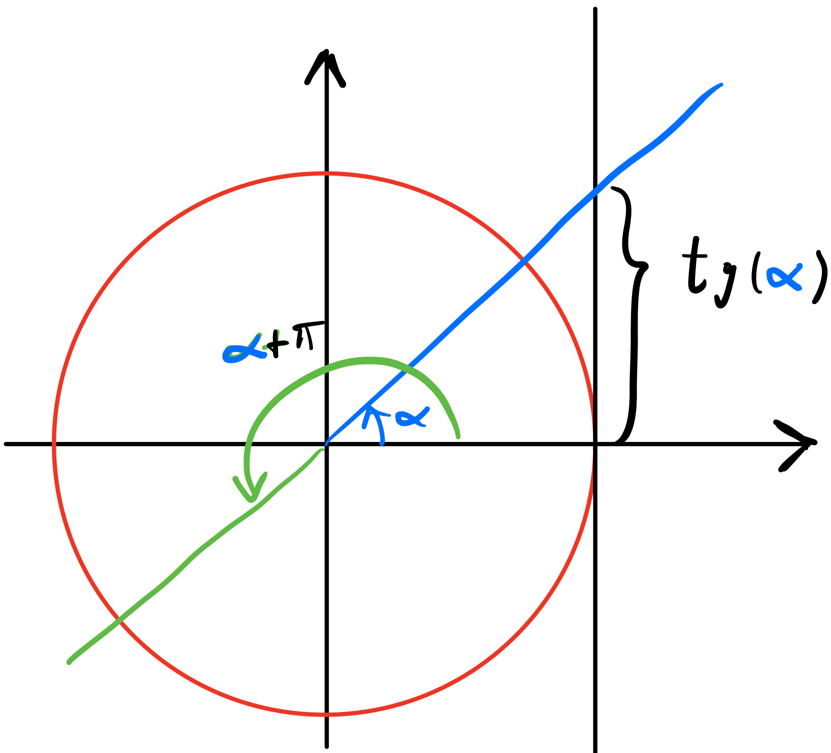
En general Tenemos

$$\left.\begin{array}{l} \operatorname{sen}(\alpha + k.2\pi) = \operatorname{sen}(\alpha) \\ \cos(\alpha + k\,2\pi) = \cos(\alpha) \end{array}\right\} \begin{array}{l} \forall \alpha \in \mathbb{R} \\ \forall k \in \mathbb{Z} \end{array}$$

$$\operatorname{sen}(\alpha + \pi) = -\operatorname{sen}(\alpha)$$

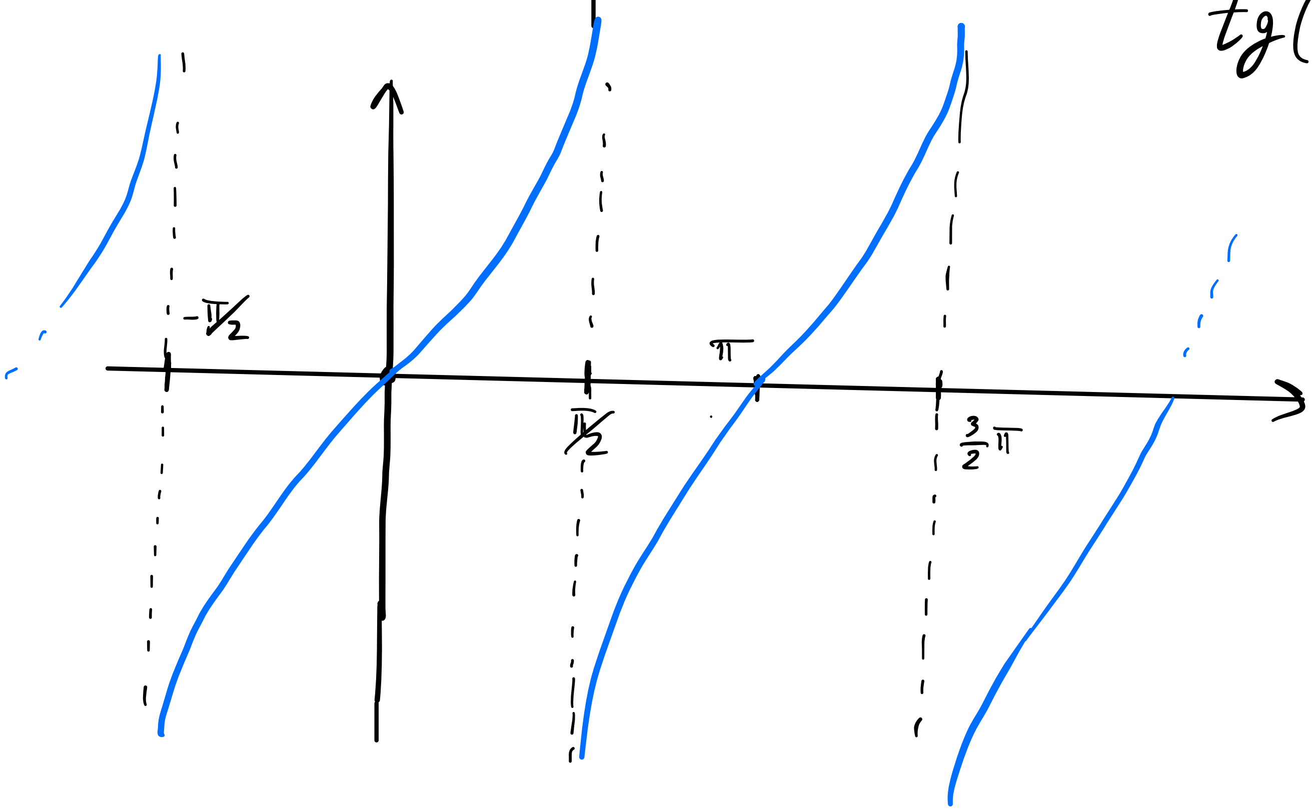
$$\cos(\alpha+\pi) = -\cos(\alpha)$$

Gráfico de $tg(\alpha)$



$$tg(\alpha) = \frac{sen(\alpha)}{\cos(\alpha)}$$

$tg(\alpha)$



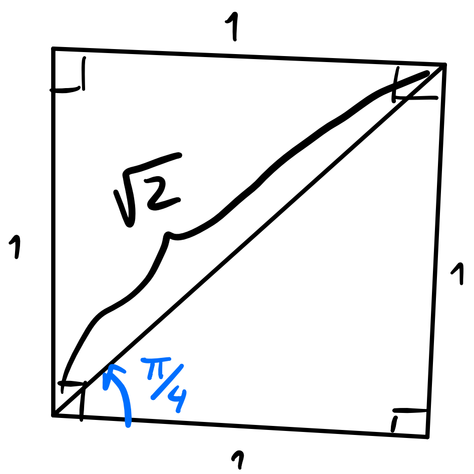
$$tg(\alpha+\pi) = \frac{sen(\alpha+\pi)}{\cos(\alpha+\pi)} = \frac{-sen(\alpha)}{-\cos(\alpha)} = tg(\alpha)$$

La periodicidad de tg es

$$tg(\alpha+\pi) = tg(\alpha)$$

$$\boxed{tg(\alpha + k\pi) = tg(\alpha) \quad \forall \alpha \in \mathbb{R},\ \forall k \in \mathbb{Z}}$$

SENOS, COSENOS Y TANGENTES NOTABLES



Pitágoras

$$(\text{hipotenusa})^2 = (\text{cat ady})^2 + (\text{cat op})^2 =$$

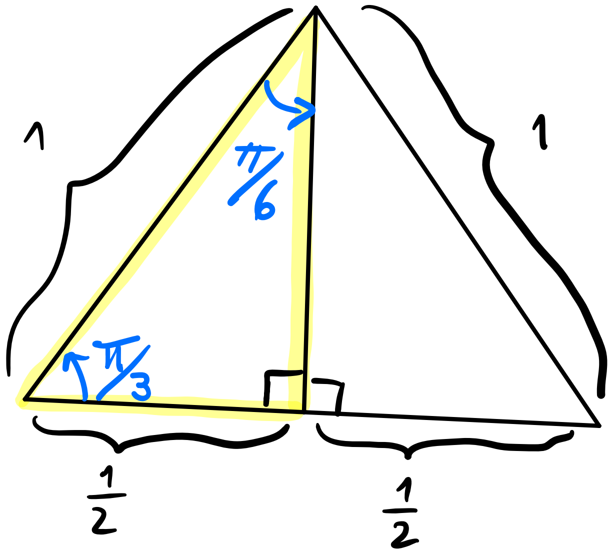
$$= 1^2 + 1^2 = 2$$

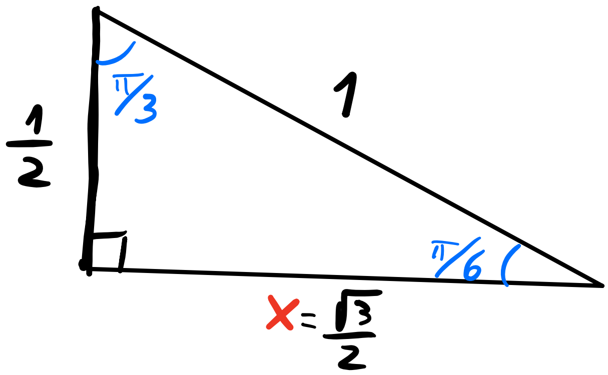
$$\Rightarrow hip = \sqrt{2}$$

$$\cos(\pi/4) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$sen(\pi/4) = \frac{1}{\sqrt{2}}$$

$$tg(\pi/4) = 1$$





$$x^2 + \left(\frac{1}{2}\right)^2 = 1^2$$

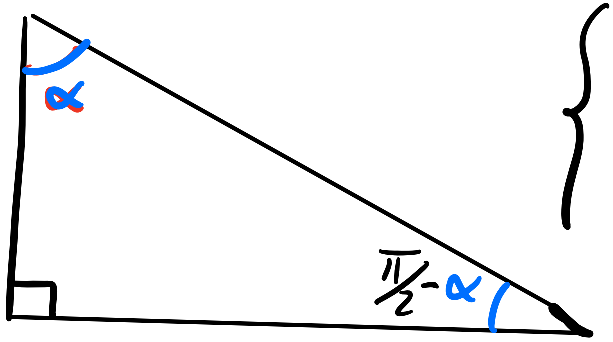
$$x^2 = 1 - \frac{1}{4} = \frac{3}{4} \Rightarrow x = \frac{\sqrt{3}}{2}$$

$$\cos(\pi/3) = \frac{1}{2} \; ; \quad \text{sen}(\pi/3) = \frac{\sqrt{3}}{2} \; ;$$

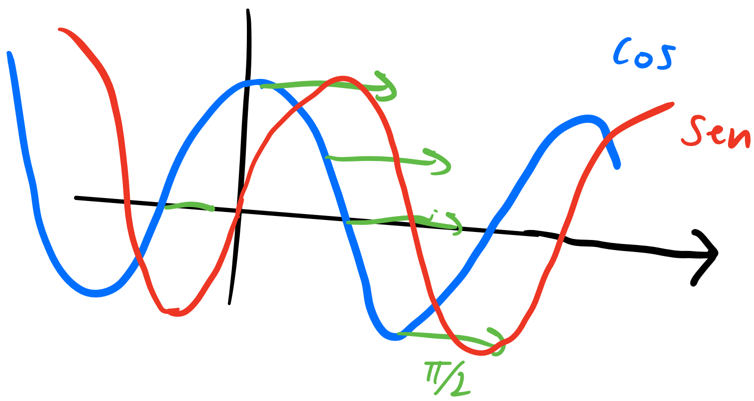
$$\text{tg}(\pi/3) = \frac{(\sqrt{3}/2)}{(1/2)} = \frac{\sqrt{3}}{2} \cdot 2 = \sqrt{3}$$

$$\cos(\pi/6) = \frac{\sqrt{3}}{2} \qquad \text{sen}(\pi/6) = \frac{1}{2}$$

$$tg\left(\pi/6\right) = \frac{(1/2)}{(\sqrt{3}/2)} = \frac{1}{\sqrt{3}}$$



$$\begin{cases} sen(\alpha) \overset{*}{=} \cos(\pi/2 - \alpha) \\ \cos(\alpha) = sen(\pi/2 - \alpha) \end{cases}$$



Cos es par

$$sen(\alpha) = \cos(-(\alpha - \pi/2)) =$$

$$= \cos(\alpha - \pi/2)$$

$$tg(\pi/2 - \alpha) = \frac{sen(\pi/2 - \alpha)}{\cos(\pi/2 - \alpha)} = \frac{\cos(\alpha)}{sen(\alpha)} =$$

$$= \left(\frac{sen(\alpha)}{\cos(\alpha)}\right)^{-1} = \frac{1}{tg(\alpha)}$$