

CPUCalle Mercado # 555
Teléfono 3 -366191**IDENTIDADES
TRIGONOMÉTRICAS**

$$\begin{aligned} \operatorname{sen} \alpha &= \frac{1}{\operatorname{csc} \alpha} & \operatorname{csc} \alpha &= \frac{1}{\operatorname{sen} \alpha} \\ \cos \alpha &= \frac{1}{\operatorname{sec} \alpha} & \operatorname{sec} \alpha &= \frac{1}{\cos \alpha} \\ \tan \alpha &= \frac{1}{\cot \alpha} & \cot \alpha &= \frac{1}{\tan \alpha} \\ \tan \alpha &= \frac{\operatorname{sen} \alpha}{\cos \alpha} & \cot \alpha &= \frac{\cos \alpha}{\operatorname{sen} \alpha} \end{aligned}$$

$$\begin{aligned} \operatorname{sen}^2 \alpha + \cos^2 \alpha &= 1 & \operatorname{sec}^2 \alpha &= 1 + \tan^2 \alpha & \operatorname{csc}^2 \alpha &= 1 + \cot^2 \alpha \\ 1 - \operatorname{sen}^2 \alpha &= \cos^2 \alpha & \operatorname{sec}^2 \alpha - \tan^2 \alpha &= 1 & \operatorname{csc}^2 \alpha - \cot^2 \alpha &= 1 \\ 1 - \cos^2 \alpha &= \operatorname{sen}^2 \alpha & \tan^2 \alpha &= \operatorname{sec}^2 \alpha - 1 & \cot^2 \alpha &= \operatorname{csc}^2 \alpha - 1 \end{aligned}$$

$$\begin{aligned} \operatorname{sen} \frac{\alpha}{2} &= \sqrt{\frac{1 - \cos \alpha}{2}} \\ \cos \frac{\alpha}{2} &= \sqrt{\frac{1 + \cos \alpha}{2}} \\ \tan \frac{\alpha}{2} &= \sqrt{\frac{1 - \cos \alpha}{1 + \cos \alpha}} \\ \tan \frac{\alpha}{2} &= \frac{\operatorname{sen} \alpha}{1 + \cos \alpha} \\ \tan \frac{\alpha}{2} &= \frac{1 - \cos \alpha}{\operatorname{sen} \alpha} \end{aligned}$$

$$\begin{aligned} \operatorname{sen} 2\alpha &= 2 \operatorname{sen} \alpha \cos \alpha \\ \cos 2\alpha &= \cos^2 \alpha - \operatorname{sen}^2 \alpha \\ \cos 2\alpha &= 1 - 2 \operatorname{sen}^2 \alpha \\ \cos 2\alpha &= 2 \cos^2 \alpha - 1 \\ \tan 2\alpha &= \frac{2 \tan \alpha}{1 - \tan^2 \alpha} \end{aligned}$$

$$\begin{aligned} \operatorname{sen} 3\alpha &= 3 \operatorname{sen} \alpha - 4 \operatorname{sen}^3 \alpha \\ \cos 3\alpha &= 4 \cos^3 \alpha - 3 \cos \alpha \\ \tan 3\alpha &= \frac{3 \tan \alpha - \tan^3 \alpha}{1 - 3 \tan^2 \alpha} \end{aligned}$$

$$\begin{aligned} \operatorname{sen} a \cos b &= \frac{1}{2} [\operatorname{sen}(a+b) + \operatorname{sen}(a-b)] \\ \cos a \operatorname{sen} b &= \frac{1}{2} [\operatorname{sen}(a+b) - \operatorname{sen}(a-b)] \\ \cos a \cos b &= \frac{1}{2} [\cos(a+b) + \cos(a-b)] \\ \operatorname{sen} a \operatorname{sen} b &= -\frac{1}{2} [\cos(a+b) - \cos(a-b)] \end{aligned}$$

$$\begin{aligned} \operatorname{sen} a + \operatorname{sen} b &= 2 \operatorname{sen} \left(\frac{a+b}{2} \right) \cos \left(\frac{a-b}{2} \right) \\ \operatorname{sen} a - \operatorname{sen} b &= 2 \cos \left(\frac{a+b}{2} \right) \operatorname{sen} \left(\frac{a-b}{2} \right) \\ \cos a + \cos b &= 2 \cos \left(\frac{a+b}{2} \right) \cos \left(\frac{a-b}{2} \right) \\ \cos a - \cos b &= -2 \operatorname{sen} \left(\frac{a+b}{2} \right) \operatorname{sen} \left(\frac{a-b}{2} \right) \end{aligned}$$

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$$\begin{aligned} \operatorname{sen}(a+b) &= \operatorname{sen} a \cos b + \operatorname{sen} b \cos a & \operatorname{sen}(a-b) &= \operatorname{sen} a \cos b - \operatorname{sen} b \cos a \\ \cos(a+b) &= \cos a \cos b - \operatorname{sen} a \operatorname{sen} b & \cos(a-b) &= \cos a \cos b + \operatorname{sen} a \operatorname{sen} b \\ \tan(a+b) &= \frac{\tan a + \tan b}{1 - \tan a \tan b} & \tan(a-b) &= \frac{\tan a - \tan b}{1 + \tan a \tan b} \end{aligned}$$

$$\begin{aligned} \operatorname{sen}(-a) &= -\operatorname{sen} a & \cot(-a) &= -\cot a \\ \cos(-a) &= \cos a & \operatorname{sec}(-a) &= \operatorname{sec} a \\ \tan(-a) &= -\tan a & \operatorname{csc}(-a) &= -\operatorname{csc} a \end{aligned}$$

$$\begin{aligned} \operatorname{sen}(90^\circ - a) &= \cos a & \cot(90^\circ - a) &= \tan a \\ \cos(90^\circ - a) &= \operatorname{sen} a & \operatorname{sec}(90^\circ - a) &= \operatorname{csc} a \\ \tan(90^\circ - a) &= \cot a & \operatorname{csc}(90^\circ - a) &= \operatorname{sec} a \end{aligned}$$

$$\begin{aligned} \operatorname{sen}(180^\circ - a) &= \operatorname{sen} a & \cot(180^\circ - a) &= -\cot a \\ \cos(180^\circ - a) &= -\cos a & \operatorname{sec}(180^\circ - a) &= -\operatorname{sec} a \\ \tan(180^\circ - a) &= -\tan a & \operatorname{csc}(180^\circ - a) &= \operatorname{csc} a \end{aligned}$$

$$\begin{aligned} \operatorname{sen}(180^\circ + a) &= -\operatorname{sen} a & \cot(180^\circ + a) &= \cot a \\ \cos(180^\circ + a) &= -\cos a & \operatorname{sec}(180^\circ + a) &= -\operatorname{sec} a \\ \tan(180^\circ + a) &= \tan a & \operatorname{csc}(180^\circ + a) &= -\operatorname{csc} a \end{aligned}$$

$$\begin{aligned} \operatorname{sen}(360^\circ - a) &= -\operatorname{sen} a & \cot(360^\circ - a) &= -\cot a \\ \cos(360^\circ - a) &= \cos a & \operatorname{sec}(360^\circ - a) &= \operatorname{sec} a \\ \tan(360^\circ - a) &= -\tan a & \operatorname{csc}(360^\circ - a) &= -\operatorname{csc} a \end{aligned}$$