CPU

Calle Mercado # 555
Teléfono 3 -366191

IDENTIDADES TRIGONOMÉTRICAS

$$\operatorname{sen}\alpha=\frac{1}{\csc\alpha}\qquad \csc\alpha=\frac{1}{\operatorname{sen}\alpha}$$
$$\cos\alpha=\frac{1}{\sec\alpha}\qquad \sec\alpha=\frac{1}{\cos\alpha}$$
$$\tan\alpha=\frac{1}{\cot\alpha}\qquad \cot\alpha=\frac{1}{\tan\alpha}$$
$$\tan\alpha=\frac{\operatorname{sen}\alpha}{\cos\alpha}\qquad \cot\alpha=\frac{\cos\alpha}{\operatorname{sen}\alpha}$$

$$\operatorname{sen}^2\alpha+\cos^2\alpha=1\qquad \sec^2\alpha=1+\tan^2\alpha\qquad \csc^2\alpha=1+\cot^2\alpha$$
$$1-\operatorname{sen}^2\alpha=\cos^2\alpha\qquad \sec^2\alpha-\tan^2\alpha=1\qquad \csc^2\alpha-\cot^2\alpha=1$$
$$1-\cos^2\alpha=\operatorname{sen}^2\alpha\qquad \tan^2\alpha=\sec^2\alpha-1\qquad \cot^2\alpha=\csc^2\alpha-1$$

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

$$\operatorname{sen}2\alpha=2\operatorname{sen}\alpha\cos\alpha$$
$$\cos2\alpha=\cos^2\alpha-\operatorname{sen}^2\alpha$$
$$\cos2\alpha=1-2\operatorname{sen}^2\alpha$$
$$\cos2\alpha=2\cos^2\alpha-1$$
$$\tan2\alpha=\frac{2\tan\alpha}{1-\tan^2\alpha}$$

$$\operatorname{sen}3\alpha=3\operatorname{sen}\alpha-4\operatorname{sen}^3\alpha$$
$$\cos3\alpha=4\cos^3\alpha-3\cos\alpha$$
$$\tan3\alpha=\frac{3\tan\alpha-\tan^3\alpha}{1-3\tan^2\alpha}$$

$$\operatorname{sen}a\cos b=\frac{1}{2}\left[\operatorname{sen}(a+b)+\operatorname{sen}(a-b)\right]$$
$$\cos a\operatorname{sen}b=\frac{1}{2}\left[\operatorname{sen}(a+b)-\operatorname{sen}(a-b)\right]$$
$$\cos a\cos b=\frac{1}{2}\left[\cos(a+b)+\cos(a-b)\right]$$
$$\operatorname{sen}a\operatorname{sen}b=-\frac{1}{2}\left[\cos(a+b)-\cos(a-b)\right]$$

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

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$$\operatorname{sen}(a+b)=\operatorname{sen}a\cos b+\operatorname{sen}b\cos a\qquad \operatorname{sen}(a-b)=\operatorname{sen}a\cos b-\operatorname{sen}b\cos a$$
$$\cos(a+b)=\cos a\cos b-\operatorname{sen}a\operatorname{sen}b\qquad \cos(a-b)=\cos a\cos b+\operatorname{sen}a\operatorname{sen}b$$
$$\tan(a+b)=\frac{\tan a+\tan b}{1-\tan a\tan b}\qquad \tan(a-b)=\frac{\tan a-\tan b}{1+\tan a\tan b}$$

$$\operatorname{sen}(-a)=-\operatorname{sen}a\qquad \cot(-a)=-\cot a$$
$$\cos(-a)=\cos a\qquad \sec(-a)=\sec a$$
$$\tan(-a)=-\tan a\qquad \csc(-a)=-\csc a$$

$$\operatorname{sen}(90^\circ-a)=\cos a\qquad \cot(90^\circ-a)=\tan a$$
$$\cos(90^\circ-a)=\operatorname{sen}a\qquad \sec(90^\circ-a)=\csc a$$
$$\tan(90^\circ-a)=\cot a\qquad \csc(90^\circ-a)=\sec a$$

$$\operatorname{sen}(180^\circ-a)=\operatorname{sen}a\qquad \cot(180^\circ-a)=-\cot a$$
$$\cos(180^\circ-a)=-\cos a\qquad \sec(180^\circ-a)=-\sec a$$
$$\tan(180^\circ-a)=-\tan a\qquad \csc(180^\circ-a)=\csc a$$

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

$$\operatorname{sen}(360^\circ-a)=-\operatorname{sen}a\qquad \cot(360^\circ-a)=-\cot a$$
$$\cos(360^\circ-a)=\cos a\qquad \sec(360^\circ-a)=\sec a$$
$$\tan(360^\circ-a)=-\tan a\qquad \csc(360^\circ-a)=-\csc a$$