Identidades Trigonométricas

Identidades básicas

$$\operatorname{sen}\alpha = \frac{1}{\csc\alpha} \qquad \csc\alpha = \frac{1}{\operatorname{sen}\alpha}$$

$$\cos\alpha = \frac{1}{\sec\alpha} \qquad \sec\alpha = \frac{1}{\cos\alpha}$$

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

$$\tan\alpha = \frac{1}{\cot\alpha} \qquad \cot\alpha = \frac{1}{\tan\alpha}$$

Identidades Pitagóricas

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

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

$$\cos^2\alpha = 1 - \operatorname{sen}^2\alpha$$

$$\tan^2\alpha + 1 = \sec^2\alpha \qquad \csc^2\alpha - \cot^2\alpha = 1$$

$$\tan^2\alpha = \sec^2\alpha - 1 \qquad \sec^2\alpha - \tan^2\alpha = 1$$

$$\operatorname{sen}^2\alpha = \frac{1-\cos(2\alpha)}{2} \qquad \cos^2\alpha = \frac{1+\cos(2\alpha)}{2}$$

Identidades básicas para adiciones o diferencias de ángulos

$$\operatorname{sen}(\alpha \pm \beta) = \operatorname{sen}\alpha\cos\beta \pm \operatorname{sen}\beta\cos\alpha$$

$$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \operatorname{sen}\alpha\operatorname{sen}\beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan\alpha \pm \tan\beta}{1 \mp \tan\alpha\tan\beta}$$

Identidades para ángulos dobles

$$\operatorname{sen}(2\alpha) = 2\operatorname{sen}\alpha\cos\alpha$$

$$\cos(2\alpha) = \cos^2\alpha - \operatorname{sen}^2\alpha$$

$$\tan(2\alpha) = \frac{2\tan\alpha}{1-\tan^2\alpha}$$

Identidades para el producto-suma senos y cosenos

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

$$\cos\alpha + \cos\beta = 2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$$

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

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

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

$$\cos\alpha\cos\beta = \frac{1}{2}\left[\cos(\alpha-\beta) + \cos(\alpha+\beta)\right]$$

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

Identidades para la paridad de funciones

$$\operatorname{sen}(-\alpha) = -\operatorname{sen}\alpha \qquad \csc(-\alpha) = \csc\alpha$$

$$\cos(-\alpha) = \cos\alpha \qquad \sec(-\alpha) = \sec\alpha$$

$$\tan(-\alpha) = -\tan\alpha \qquad \cot(-\alpha) = -\cot\alpha$$