

Resumen de Fórmulas e Identidades Trigonométricas

Identidades Básicas

$$\operatorname{sen} \theta \cdot \csc \theta = 1 \quad \Rightarrow \quad \operatorname{sen} \theta = \frac{1}{\csc \theta}, \quad \csc \theta = \frac{1}{\operatorname{sen} \theta}$$

$$\cos \theta \cdot \sec \theta = 1 \quad \Rightarrow \quad \cos \theta = \frac{1}{\sec \theta}, \quad \sec \theta = \frac{1}{\cos \theta}$$

$$\tan \theta \cdot \cot \theta = 1 \quad \Rightarrow \quad \tan \theta = \frac{1}{\cot \theta}, \quad \cot \theta = \frac{1}{\tan \theta}$$

$$\tan \theta = \frac{\operatorname{sen} \theta}{\cos \theta} \quad \cot \theta = \frac{\cos \theta}{\operatorname{sen} \theta}$$

Identidades Pitagóricas

$$\operatorname{sen}^2 \theta + \cos^2 \theta = 1$$

$$\operatorname{sen}^2 \theta = 1 - \cos^2 \theta \quad \Rightarrow \quad \operatorname{sen} \theta = \pm \sqrt{1 - \cos^2 \theta}$$

$$\cos^2 \theta = 1 - \operatorname{sen}^2 \theta \quad \Rightarrow \quad \cos \theta = \pm \sqrt{1 - \operatorname{sen}^2 \theta}$$

$$\tan^2 \theta + 1 = \sec^2 \theta \quad \Rightarrow \quad \tan^2 \theta = \sec^2 \theta - 1$$

$$1 + \cot^2 \theta = \csc^2 \theta \quad \Rightarrow \quad \cot^2 \theta = \csc^2 \theta - 1$$

Identidades Par e Impar

Funciones Pares: $\cos(-\theta) = \cos \theta, \quad \sec(-\theta) = \sec \theta$

Funciones Impares: $\operatorname{sen}(-\theta) = -\operatorname{sen} \theta, \quad \csc(-\theta) = -\csc \theta, \quad \tan(-\theta) = -\tan \theta, \quad \cot(-\theta) = -\cot \theta$

Suma y Resta de ángulos

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

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

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

Ángulos Dobles

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

$$\cos(2\theta) = \begin{cases} \cos^2 \theta - \operatorname{sen}^2 \theta, \\ 1 - 2 \operatorname{sen}^2 \theta, \\ 2 \cos^2 \theta - 1, \end{cases}$$

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

Ángulos Medios

$$\operatorname{sen}\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos \theta}{2}}$$

$$\cos\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

$$\tan\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}} = \frac{1 - \cos \theta}{\operatorname{sen} \theta} = \frac{\operatorname{sen} \theta}{1 + \cos \theta}$$

Identidades Producto–Suma

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

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

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

Identidades Suma–Producto

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

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

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

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