

Relaciones básicas

$$\begin{aligned} \operatorname{sen}^2 x + \operatorname{cos}^2 x &= 1, & 1 + \tan^2 x &= \frac{1}{\operatorname{cos}^2 x}, & \tan x &= \frac{\operatorname{sen} x}{\operatorname{cos} x} \\ \sec x &= \frac{1}{\operatorname{cos} x}, & \operatorname{cosec} x &= \frac{1}{\operatorname{sen} x}, & \cot x &= \frac{\operatorname{cos} x}{\operatorname{sen} x} = \frac{1}{\tan x} \end{aligned}$$

Ángulo doble

$$\operatorname{sen} 2x = 2 \operatorname{sen} x \operatorname{cos} x, \quad \operatorname{cos} 2x = \operatorname{cos}^2 x - \operatorname{sen}^2 x, \quad \tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$$

Ángulo mitad

$$\operatorname{sen} \frac{x}{2} = \pm \sqrt{\frac{1 - \operatorname{cos} x}{2}}, \quad \operatorname{cos} \frac{x}{2} = \pm \sqrt{\frac{1 + \operatorname{cos} x}{2}}, \quad \tan \frac{x}{2} = \pm \sqrt{\frac{1 - \operatorname{cos} x}{1 + \operatorname{cos} x}}$$

Suma-resta de ángulos

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

Suma-resta de función trigonométrica

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

Fórmulas para triángulos

Teorema del seno

$$\frac{a}{\operatorname{sen} A} = \frac{b}{\operatorname{sen} B} = \frac{c}{\operatorname{sen} C}$$

Teorema de los cosenos

$$\begin{aligned} a^2 &= b^2 + c^2 - 2bc \operatorname{cos} A \\ b^2 &= a^2 + c^2 - 2ac \operatorname{cos} B \\ c^2 &= a^2 + b^2 - 2ab \operatorname{cos} C \end{aligned}$$

Suma de los ángulos

$$A + B + C = 180^\circ$$

