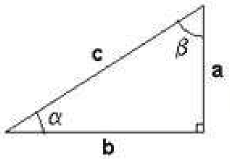
FORMULARIO DE TRIGONOMETRÍA

RAZONES TRIGONOMÉTRICAS EN EL TRIÁNGULO RECTÁNGULO



$$\operatorname{sen}\alpha = \frac{\text{cateto opuesto a } \alpha}{\text{hipotenusa}} = \frac{a}{c}$$

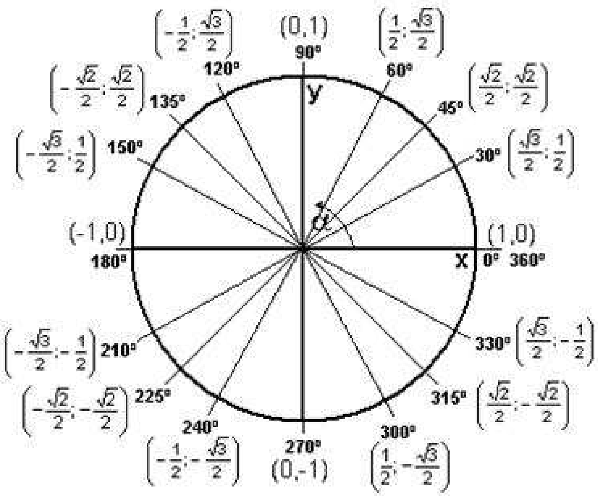
$$\cos\alpha = \frac{\text{cateto adyacente a } \alpha}{\text{hipotenusa}} = \frac{b}{c}$$

$$\operatorname{tg}\alpha = \frac{\text{cateto opuesto a } \alpha}{\text{cateto adyacente a } \alpha} = \frac{a}{b}$$

RAZONES TRIGONOMÉTRICAS DE LOS ÁNGULOS NOTABLES

		Seno	Coseno	Tangente
30°	$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
45°	$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
60°	$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$

CÍRCULO TRIGONOMÉTRICO



$\cos\alpha = x$ $\operatorname{sen}\alpha = y$

$180^\circ \rightarrow \pi$

RELACIONES ENTRE LAS FUNCIONES TRIGONOMÉTRICAS

$$\operatorname{sen}^2\alpha + \cos^2\alpha = 1 \qquad \operatorname{tg}\alpha = \frac{\operatorname{sen}\alpha}{\cos\alpha} \qquad \sec\alpha = \frac{1}{\cos\alpha}$$

$$1 + \operatorname{tg}^2\alpha = \sec^2\alpha$$

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

$$\operatorname{tg}\alpha = \frac{1}{\operatorname{ctg}\alpha}$$

SIGNO DE LAS FUNCIONES EN CADA CUADRANTE

	I	II	III	IV
sen	+	+	–	–
cos	+	–	–	+
tg	+	–	+	–

IDENTIDADES DE SUMA Y DIFERENCIA DE ÁNGULOS

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

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

$$\cos(\alpha+\beta) = \cos\alpha.\cos\beta - \operatorname{sen}\alpha.\operatorname{sen}\beta$$

$$\cos(\alpha-\beta) = \cos\alpha.\cos\beta + \operatorname{sen}\alpha.\operatorname{sen}\beta$$

$$\operatorname{tg}(\alpha+\beta) = \frac{\operatorname{tg}\alpha + \operatorname{tg}\beta}{1 - \operatorname{tg}\alpha.\operatorname{tg}\beta} \qquad \operatorname{tg}(\alpha-\beta) = \frac{\operatorname{tg}\alpha - \operatorname{tg}\beta}{1 + \operatorname{tg}\alpha.\operatorname{tg}\beta}$$

IDENTIDADES DEL ÁNGULO DOBLE

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

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

IDENTIDADES DEL ÁNGULO MEDIO

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

$$\operatorname{tg}\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1-\cos\alpha}{1+\cos}}$$

FUNCIONES TRIGONOMÉTRICAS DE ÁNGULOS OPUESTOS

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

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

$$\operatorname{tg}(-\alpha) = -\operatorname{tg}\alpha \qquad \operatorname{ctg}(-\alpha) = -\operatorname{ctg}\alpha$$

FÓRMULAS DE REDUCCIÓN AL PRIMER CUADRANTE ($\beta \in$ Ic)

- II CUADRANTE ($90^\circ < \alpha < 180^\circ$) $\beta = 180^\circ - \alpha$
- III CUADRANTE ($180^\circ < \alpha < 270^\circ$) $\beta = \alpha - 180^\circ$
- IV CUADRANTE ($270^\circ < \alpha < 360^\circ$) $\beta = 360^\circ - \alpha$

TRANSFORMACIÓN EN PRODUCTO DE LA SUMA O DIFERENCIA DE COSENOS Y SENOS

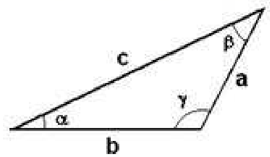
$$\operatorname{sen}A + \operatorname{sen}B = 2\operatorname{sen}\left(\frac{A+B}{2}\right).\cos\left(\frac{A-B}{2}\right)$$

$$\operatorname{sen}A - \operatorname{sen}B = 2\cos\left(\frac{A+B}{2}\right).\operatorname{sen}\left(\frac{A-B}{2}\right)$$

$$\cos A + \cos B = 2\cos\left(\frac{A+B}{2}\right).\cos\left(\frac{A-B}{2}\right)$$

$$\cos A - \cos B = -2\operatorname{sen}\left(\frac{A+B}{2}\right).\operatorname{sen}\left(\frac{A-B}{2}\right)$$

TEOREMAS DEL SENO Y COSENO



TEOREMA DEL SENO

$$\frac{a}{\operatorname{sen}\alpha} = \frac{b}{\operatorname{sen}\beta} = \frac{c}{\operatorname{sen}\gamma}$$

TEOREMA DEL COSENO

$$a^2 = b^2 + c^2 - 2\cdot b\cdot c\cdot\cos\alpha$$

$$b^2 = a^2 + c^2 - 2\cdot a\cdot c\cdot\cos\beta$$

$$c^2 = a^2 + b^2 - 2\cdot a\cdot c\cdot\cos\alpha$$

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