

MEDIDAS DE ÁNGULOS

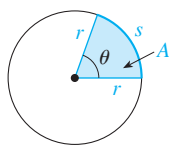
$$\pi \text{ radianes} = 180^\circ$$

$$1^\circ = \frac{\pi}{180} \text{ rad} \quad 1 \text{ rad} = \frac{180^\circ}{\pi}$$

$$s = r\theta \quad A = \frac{1}{2}r^2\theta \quad (\theta \text{ en radianes})$$

Para convertir de grados a radianes, multiplicar por $\frac{\pi}{180}$.

Para convertir de radianes a grados, multiplicar por $\frac{180}{\pi}$.

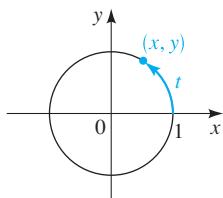


FUNCIONES TRIGONOMÉTRICAS DE NÚMEROS REALES

$$\sin t = y \quad \csc t = \frac{1}{y}$$

$$\cos t = x \quad \sec t = \frac{1}{x}$$

$$\tan t = \frac{y}{x} \quad \cot t = \frac{x}{y}$$

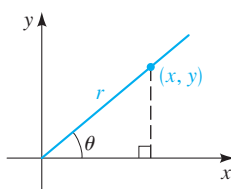


FUNCIONES TRIGONOMÉTRICAS DE ÁNGULOS

$$\sin \theta = \frac{y}{r} \quad \csc \theta = \frac{r}{y}$$

$$\cos \theta = \frac{x}{r} \quad \sec \theta = \frac{r}{x}$$

$$\tan \theta = \frac{y}{x} \quad \cot \theta = \frac{x}{y}$$

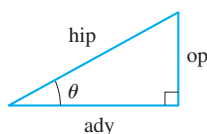


TRIGONOMETRÍA DE UN ÁNGULO RECTO

$$\sin \theta = \frac{\text{op}}{\text{hip}} \quad \csc \theta = \frac{\text{hip}}{\text{op}}$$

$$\cos \theta = \frac{\text{ady}}{\text{hip}} \quad \sec \theta = \frac{\text{hip}}{\text{ady}}$$

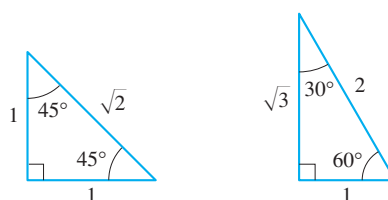
$$\tan \theta = \frac{\text{op}}{\text{ady}} \quad \cot \theta = \frac{\text{ady}}{\text{op}}$$



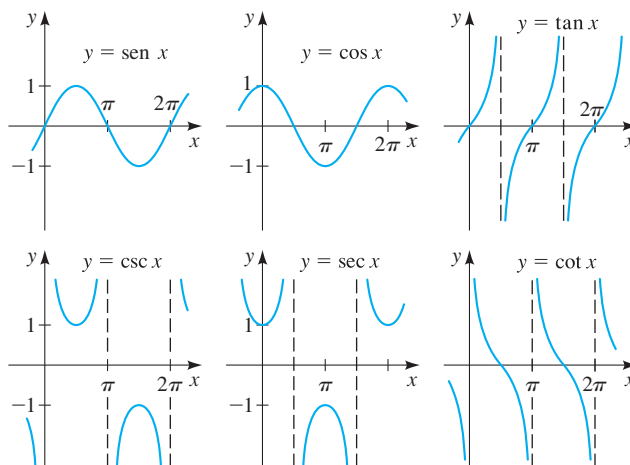
VALORES ESPECIALES DE LAS FUNCIONES TRIGONOMÉTRICAS

θ	radianes	$\sin \theta$	$\cos \theta$	$\tan \theta$
0°	0	0	1	0
30°	$\pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$
45°	$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
60°	$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$
90°	$\pi/2$	1	0	—
180°	π	0	-1	0
270°	$3\pi/2$	-1	0	—

TRIÁNGULOS ESPECIALES



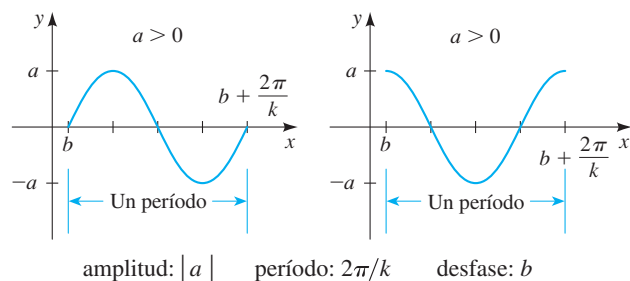
GRÁFICAS DE LAS FUNCIONES TRIGONOMÉTRICAS



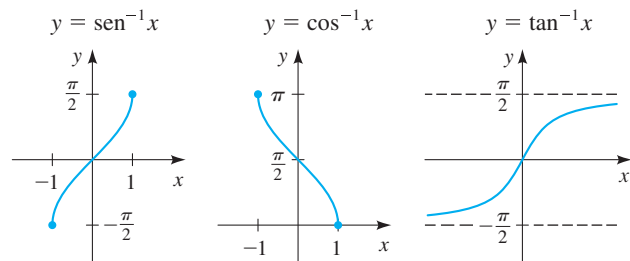
CURVAS SENO Y COSENO

$$y = a \sin k(x - b) \quad (k > 0)$$

$$y = a \cos k(x - b) \quad (k > 0)$$



GRÁFICAS DE LAS FUNCIONES TRIGONOMÉTRICAS INVERsas



IDENTIDADES FUNDAMENTALES

$$\sec x = \frac{1}{\cos x}$$

$$\csc x = \frac{1}{\sin x}$$

$$\tan x = \frac{\sin x}{\cos x}$$

$$\cot x = \frac{1}{\tan x}$$

$$\sin^2 x + \cos^2 x = 1 \quad 1 + \tan^2 x = \sec^2 x \quad 1 + \cot^2 x = \csc^2 x$$

$$\sin(-x) = -\sin x \quad \cos(-x) = \cos x \quad \tan(-x) = -\tan x$$

IDENTIDADES DE COFUNCIONES

$$\sin\left(\frac{\pi}{2} - x\right) = \cos x \quad \cos\left(\frac{\pi}{2} - x\right) = \sin x$$

$$\tan\left(\frac{\pi}{2} - x\right) = \cot x \quad \cot\left(\frac{\pi}{2} - x\right) = \tan x$$

$$\sec\left(\frac{\pi}{2} - x\right) = \csc x \quad \csc\left(\frac{\pi}{2} - x\right) = \sec x$$

IDENTIDADES DE REDUCCIÓN

$$\sin(x + \pi) = -\sin x \quad \sin\left(x + \frac{\pi}{2}\right) = \cos x$$

$$\cos(x + \pi) = -\cos x \quad \cos\left(x + \frac{\pi}{2}\right) = -\sin x$$

$$\tan(x + \pi) = \tan x \quad \tan\left(x + \frac{\pi}{2}\right) = -\cot x$$

FÓRMULAS PARA ADICIÓN Y SUSTRACCIÓN

$$\sin(x + y) = \sin x \cos y + \cos x \sin y$$

$$\sin(x - y) = \sin x \cos y - \cos x \sin y$$

$$\cos(x + y) = \cos x \cos y - \sin x \sin y$$

$$\cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y} \quad \tan(x - y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$$

FÓRMULAS DE ÁNGULO DOBLE

$$\sin 2x = 2 \sin x \cos x \quad \cos 2x = \cos^2 x - \sin^2 x$$

$$= 2 \cos^2 x - 1$$

$$\tan 2x = \frac{2 \tan x}{1 - \tan^2 x} \quad = 1 - 2 \sin^2 x$$

FÓRMULAS PARA REDUCIR POTENCIAS

$$\sin^2 x = \frac{1 - \cos 2x}{2}$$

$$\cos^2 x = \frac{1 + \cos 2x}{2}$$

$$\tan^2 x = \frac{1 - \cos 2x}{1 + \cos 2x}$$

FÓRMULAS DE ÁNGULO MEDIO

$$\sin \frac{u}{2} = \pm \sqrt{\frac{1 - \cos u}{2}}$$

$$\cos \frac{u}{2} = \pm \sqrt{\frac{1 + \cos u}{2}}$$

$$\tan \frac{u}{2} = \frac{1 - \cos u}{\sin u} = \frac{\sin u}{1 + \cos u}$$

IDENTIDADES DE PRODUCTO A SUMA Y SUMA A PRODUCTO

$$\sin u \cos v = \frac{1}{2}[\sin(u + v) + \sin(u - v)]$$

$$\cos u \sin v = \frac{1}{2}[\sin(u + v) - \sin(u - v)]$$

$$\cos u \cos v = \frac{1}{2}[\cos(u + v) + \cos(u - v)]$$

$$\sin u \sin v = \frac{1}{2}[\cos(u - v) - \cos(u + v)]$$

$$\sin x + \sin y = 2 \sin \frac{x + y}{2} \cos \frac{x - y}{2}$$

$$\sin x - \sin y = 2 \cos \frac{x + y}{2} \sin \frac{x - y}{2}$$

$$\cos x + \cos y = 2 \cos \frac{x + y}{2} \cos \frac{x - y}{2}$$

$$\cos x - \cos y = -2 \sin \frac{x + y}{2} \sin \frac{x - y}{2}$$

LAS LEYES DE SENOS Y COSENOS

La Ley de Senos

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

La Ley de Cosenos

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

