MEDIDAS DE ÁNGULOS

 π radianes = 180°

$$1^{\circ} = \frac{\pi}{180} \operatorname{rad} \qquad 1 \operatorname{rad} = \frac{180^{\circ}}{\pi}$$

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

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

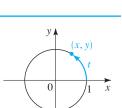
Para convertir de radianes a grados, multiplicar por $\frac{180}{\pi}$

FUNCIONES TRIGONOMÉTRICAS DE NÚMEROS REALES

$$\operatorname{sen} t = y \qquad \operatorname{csc} t = -\frac{1}{2}$$

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

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

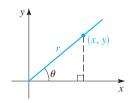


FUNCIONES TRIGONOMÉTRICAS DE ÁNGULOS

$$sen \theta = \frac{y}{r} \qquad csc \theta$$

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

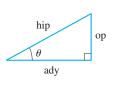
$$an \theta = \frac{y}{x} \qquad cot \theta = \frac{x}{y}$$



TRIGONOMETRÍA DE UN ÁNGULO RECTO

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

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

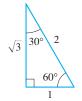


VALORES ESPECIALES DE LAS FUNCIONES TRIGONOMÉTRICAS

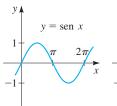
θ	radianes	sen θ	$\cos \theta$	$\tan \theta$
0°	0	0	1	0
30°	$\pi/6$	1/2	$\sqrt{3}/2$	$\sqrt{3}/3$
45°	$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
60°	$\pi/3$	$\sqrt{3}/2$	1/2	$\sqrt{3}$
90°	$\pi/2$	1	0	_
180°	π	0	-1	0
270°	$3\pi/2$	-1	0	

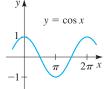
TRIÁNGULOS ESPECIALES

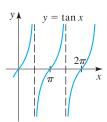


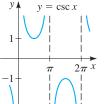


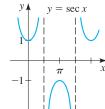
GRÁFICAS DE LAS FUNCIONES TRIGONOMÉTRICAS

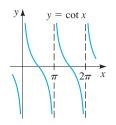






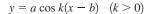


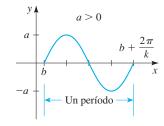


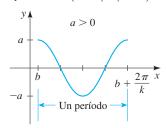


CURVAS SENO Y COSENO

 $y = a \operatorname{sen} k(x - b) \quad (k > 0)$



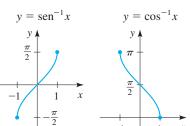


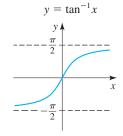


desfase: b

amplitud: |a| período: $2\pi/k$

GRÁFICAS DE LAS FUNCIONES TRIGONOMÉTRICAS INVERSAS





IDENTIDADES FUNDAMENTALES

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

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

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

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

$$sen^2 r + cos^2 r =$$

$$1 + \tan^2 r = \sec^2 r$$

$$sen^2 x + cos^2 x = 1$$
 $1 + tan^2 x = sec^2 x$ $1 + cot^2 x = csc^2 x$

$$sen(-x) = -sen$$

$$cos(-r) = cos r$$

$$\operatorname{sen}(-x) = -\operatorname{sen} x$$
 $\operatorname{cos}(-x) = \operatorname{cos} x$ $\operatorname{tan}(-x) = -\operatorname{tan} x$

IDENTIDADES DE COFUNCIONES

$$\operatorname{sen}\left(\frac{\pi}{2} - x\right) = \cos x$$

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

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

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

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

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

IDENTIDADES DE REDUCCIÓN

$$\operatorname{sen}(x + \pi) = -\operatorname{sen} x$$

$$\operatorname{sen}\left(x + \frac{\pi}{2}\right) = \cos x$$

$$\cos(x+\pi)=-\cos x$$

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

$$\tan(x + \pi) = \tan x$$

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

FÓRMULAS PARA ADICIÓN Y SUSTRACCIÓN

$$sen(x + y) = sen x cos y + cos x sen y$$

$$sen(x - y) = sen x cos y - cos x sen y$$

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

$$cos(x - y) = cos x cos y + sen x sen y$$

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

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

FÓRMULAS DE ÁNGULO DOBLE

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

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

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

$$= 1 - 2 \operatorname{sen}^2 x$$

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

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

$$\operatorname{sen} \frac{u}{2} = \pm \sqrt{\frac{1 - \cos u}{2}} \qquad \qquad \cos \frac{u}{2} = \pm \sqrt{\frac{1 + \cos u}{2}}$$

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

IDENTIDADES DE PRODUCTO A SUMA Y SUMA A PRODUCTO

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

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

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

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

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

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

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

LAS LEYES DE SENOS Y COSENOS

La Ley de Senos

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

La Lev de Cosenos

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

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

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

