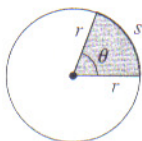


ANGLE MEASUREMENT

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

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

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



To convert from degrees to radians, multiply by $\frac{\pi}{180}$.

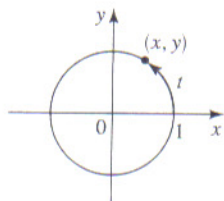
To convert from radians to degrees, multiply by $\frac{180}{\pi}$.

TRIGONOMETRIC FUNCTIONS OF REAL NUMBERS

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

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

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

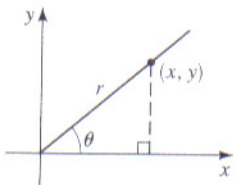


TRIGONOMETRIC FUNCTIONS OF ANGLES

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

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

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

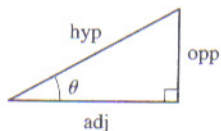


RIGHT ANGLE TRIGONOMETRY

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} \quad \csc \theta = \frac{\text{hyp}}{\text{opp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} \quad \sec \theta = \frac{\text{hyp}}{\text{adj}}$$

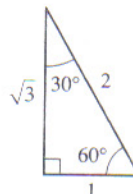
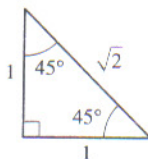
$$\tan \theta = \frac{\text{opp}}{\text{adj}} \quad \cot \theta = \frac{\text{adj}}{\text{opp}}$$



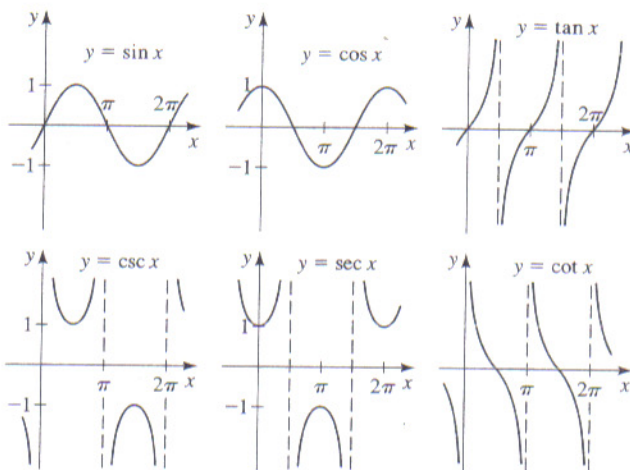
SPECIAL VALUES OF THE TRIGONOMETRIC FUNCTIONS

θ	radians	$\sin \theta$	$\cos \theta$	$\tan \theta$
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	—

SPECIAL TRIANGLES

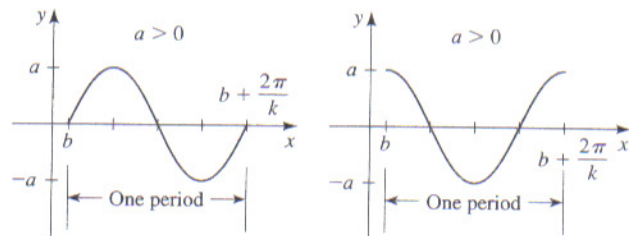


GRAPHS OF THE TRIGONOMETRIC FUNCTIONS



SINE AND COSINE CURVES

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



amplitude: $|a|$ period: $2\pi/k$ phase shift: b

GRAPHS OF THE INVERSE TRIGONOMETRIC FUNCTIONS

