

## TRIGONOMETRIC RATIOS

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

$$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

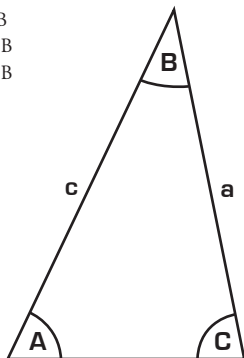
$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

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

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

$$\cot^2 \theta + 1 = \csc^2 \theta$$



## TRIGONOMETRIC RATIOS

### Law of Sines

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

### Law of Cosines

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

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

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

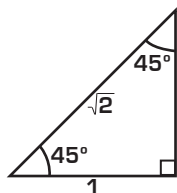
### Law of Tangents

$$\frac{a-b}{a+b} = \frac{\tan \frac{1}{2}(A-B)}{\tan \frac{1}{2}(A+B)}$$

$$\frac{b-c}{b+c} = \frac{\tan \frac{1}{2}(B-C)}{\tan \frac{1}{2}(B+C)}$$

$$\frac{c-a}{c+a} = \frac{\tan \frac{1}{2}(C-A)}{\tan \frac{1}{2}(C+A)}$$

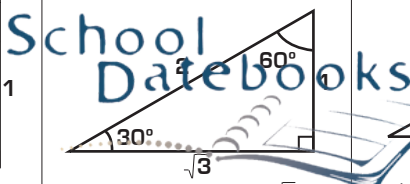
# REVIEW ONLY



$$\sin 45^\circ = \frac{1}{\sqrt{2}}$$

$$\cos 45^\circ = \frac{1}{\sqrt{2}}$$

$$\tan 45^\circ = 1$$

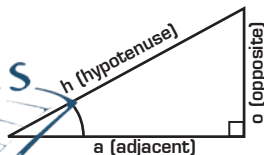


$$\sin 30^\circ = \frac{1}{2}$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$



$$\sin \theta = \frac{o \text{ (opposite)}}{h \text{ (hypotenuse)}} = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{a \text{ (adjacent)}}{h \text{ (hypotenuse)}} = \frac{1}{\sec \theta}$$

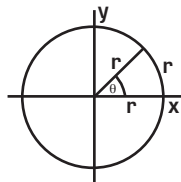
$$\tan \theta = \frac{o \text{ (opposite)}}{a \text{ (adjacent)}} = \frac{1}{\cot \theta}$$

# DO NOT SUBMIT FOR PRINT

### VALUES OF TRIGONOMETRIC RATIOS

$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\sin \theta$	0	1	0	-1	0
$\cos \theta$	1	0	-1	0	1
$\tan \theta$ ( $\sin/\cos$ )	0	$\infty$	0	$-\infty$	0
$\sec \theta$ ( $1/\cos$ )	1	$\infty$	-1	$\infty$	1
$\csc \theta$ ( $1/\sin$ )	$\infty$	1	$\infty$	-1	$\infty$
$\cot \theta$ ( $1/\tan$ )	$\infty$	0	$-\infty$	0	$\infty$

note:  $\infty$  denotes undefined or infinite



$\theta = 1$  radian  
 $\pi$  radians =  $180^\circ$   
 $2\pi$  radians =  $360^\circ$

### QUADRANTS

