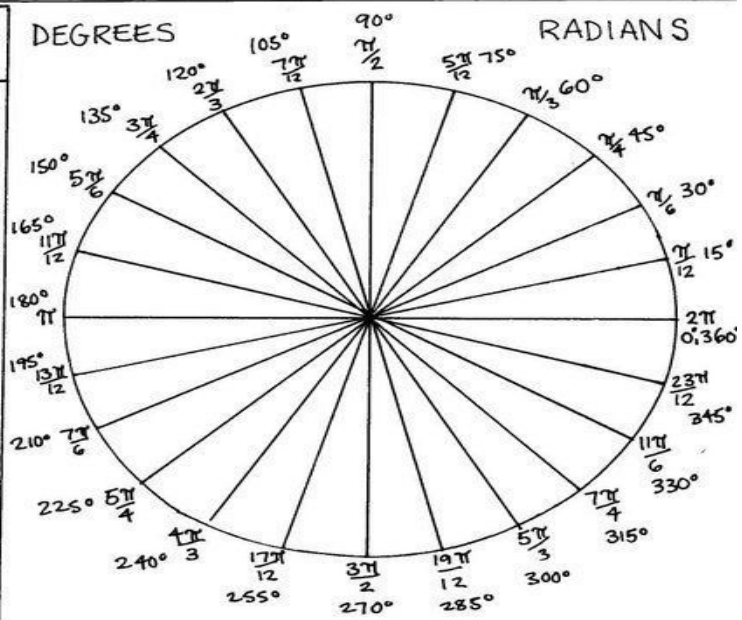
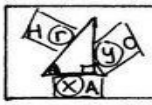
Trigonometry

Deg.	Rad.	Sine	Cosine	Tangent
30	$\pi/6$	0.5	$\sqrt{3}/2$	$1/\sqrt{3}$
45	$\pi/4$	$1/\sqrt{2}$	$1/\sqrt{2}$	1
60	$\pi/3$	$\sqrt{3}/2$	0.5	$\sqrt{3}$
90	$\pi/2$	1	0	UND.
120	$2\pi/3$	$\sqrt{3}/2$	-0.5	$-\sqrt{3}$
135	$3\pi/4$	$1/\sqrt{2}$	$-1/\sqrt{2}$	-1
150	$5\pi/6$	0.5	$-\sqrt{3}/2$	$-1/\sqrt{3}$
180	π	0	-1	0
210	$7\pi/6$	-0.5	$-\sqrt{3}/2$	$1/\sqrt{3}$
225	$5\pi/4$	$-1/\sqrt{2}$	$-1/\sqrt{2}$	1
240	$4\pi/3$	$-\sqrt{3}/2$	-0.5	$\sqrt{3}$
270	$3\pi/2$	-1	0	UND.
300	$5\pi/3$	$-\sqrt{3}/2$	0.5	$-\sqrt{3}$
315	$7\pi/4$	$-1/\sqrt{2}$	$1/\sqrt{2}$	-1
330	$11\pi/6$	-0.5	$\sqrt{3}/2$	$-1/\sqrt{3}$
0, 360	2π	0	1	0





SOH CAH TOA

Y/R X/R Y/x

Degrees - Radians $n° = n°\left(\frac{\pi}{180}\text{rad}\right)$;

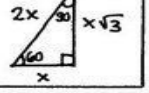
Radians - Degrees $n\pi\text{rad} = n\pi\text{rad}\left(\frac{180}{\pi\text{rad}}\right)$

Def. of Radian

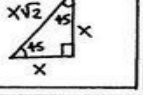
All Smart Trig Classes

Sin (+)	All (+)
Tan (+)	Cos (+)

30-60-90 $\pi/6 - \pi/3 - \pi/2$



45-45-90 $\pi/4 - \pi/4 - \pi/2$



DERIVATIVES OF BASIC TRIG FUNCTIONS If x is in radians

$\frac{d}{dx}\sin x = \cos x$ $\frac{d}{dx}\cos x = -\sin x$ $\frac{d}{dx}\sec x = \sec x\tan x$

$\frac{d}{dx}\tan x = \sec^2 x$ $\frac{d}{dx}\cot x = -\csc^2 x$ $\frac{d}{dx}\csc x = -\csc x\cot x$

$\frac{d}{dx}\sin u = \cos u \cdot u'$ $\frac{d}{dx}\tan u = \sec^2 u \cdot u'$ $\frac{d}{dx}\sec u = \sec u\tan u \cdot u'$

$\frac{d}{dx}\cos u = -\sin u \cdot u'$ $\frac{d}{dx}\cot u = -\csc^2 u \cdot u'$ $\frac{d}{dx}\csc u = -\csc u\cot u \cdot u'$

TRIG IDENTITIES

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

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

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

$\sin 2x = 2\sin x\cos x$

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

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

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

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

$\sin\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1-\cos x}{2}}$

$\cos\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1+\cos x}{2}}$

$\tan\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1-\cos x}{1+\cos x}}$

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

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

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

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

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

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

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

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

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

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

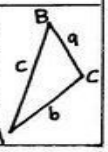
$\tan\left(\frac{\pi}{2} - \theta\right) = \cot\theta$

THE LAW OF COSINES

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

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

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



$\csc x = \frac{1}{\sin x}$ $\sec x = \frac{1}{\cos x}$ $\tan x = \frac{\sin x}{\cos x}$ $\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$

THE LAW OF SINES

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