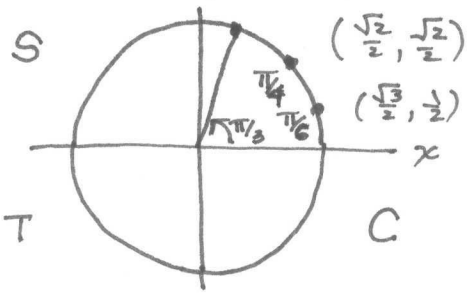
QUICK TRIG REVIEW:

Unit Circle:



In general, $P(\cos\theta, \sin\theta)$

$\uparrow \quad \uparrow$

$x \quad y$

You need your basic angle trig values:

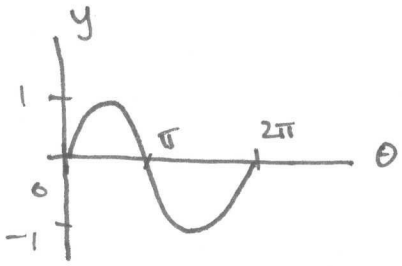
θ	$\cos\theta$	$\sin\theta$
$\frac{\pi}{6}$		
$\frac{\pi}{4}$		
$\pi/3$		

θ	$\cos\theta$	$\sin\theta$
0		
$\pi/2$		
π		
$3\pi/2$		

Plus, how to compute trig values for angles $\pi/2 < \theta < 2\pi$ using REFERENCE ANGLES plus SIGN CONSIDERATIONS

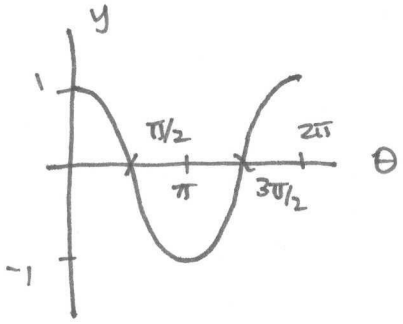
π radians $\longleftrightarrow 180^\circ$

Graphs:



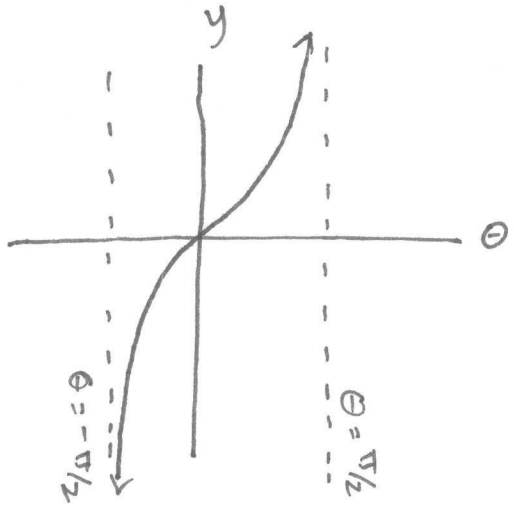
$y = \sin\theta$

period $= 2\pi$



$y = \cos\pi$

period $= 2\pi$



$y = \tan\theta$

period $= \pi$

$\tan\theta = \frac{\sin\theta}{\cos\theta}$ Reciprocals: $\cot\theta = \frac{1}{\tan\theta}$ $\sec\theta = \frac{1}{\cos\theta}$

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

Inverse Trig Fns: "The angle whose .... is ....."

$\sin^{-1} x = \arcsin x =$ "The angle θ, $-\pi/2 \le \theta \le \pi/2$, whose sine is x."

$\cos^{-1} x = \arccos x =$ "The angle θ, $0 \le \theta \le \pi$, whose cosine is x."

$\tan^{-1} x = \arctan x =$ "The angle θ, $-\pi/2 < \theta < \pi/2$, whose tangent is x."

Trigonometric Identities

The following trigonometric identities will be useful in calculus.

$$\cos^2\theta + \sin^2\theta = 1$$
$$\tan^2\theta + 1 = \sec^2\theta \quad \rightsquigarrow \text{helpful for } \int \frac{1}{1+x^2}\,dx = \tan^{-1}x + C$$
$$\cot^2\theta + 1 = \csc^2\theta$$

$$\sin(a+b) = \sin a\cos b + \cos a\sin b$$
$$\sin(a-b) = \sin a\cos b - \cos a\sin b$$
$$\cos(a+b) = \cos a\cos b - \sin a\sin b$$
$$\cos(a-b) = \cos a\cos b + \sin a\sin b$$

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

$$\cos^2\theta = \frac{1+\cos 2\theta}{2} \quad \rightsquigarrow \text{helpful for } \int \cos^2\theta\,d\theta$$
$$\sin^2\theta = \frac{1-\cos 2\theta}{2} \quad \rightsquigarrow \text{helpful for } \int \sin^2\theta\,d\theta$$

$$\cos(-\theta) = \cos\theta$$
$$\sin(-\theta) = -\sin\theta$$

It is *not* necessary to memorize all of the above identities! By knowing how an identity is derived, one can reduce the amount of memorization necessary.