Basic Fact Sheet of Trig Values and Identities

For a right triangle with one of its angles given by θ, we define the ratios:

$\cos(\theta) = \frac{adjacent}{hypotenuse}$	$\tan(\theta) = \frac{opposite}{adjacent}$	$\sec(\theta) = \frac{hypotenuse}{adjacent}$
$\sin(\theta) = \frac{opposite}{hypotenuse}$	$\cot(\theta) = \frac{adjacent}{opposite}$	$\csc(\theta) = \frac{hypotenuse}{opposite}$

Note that the above definitions only make sense if the angle is between 0 and 90 degrees.
For angles beyond 90 degrees, we define the values by

$\cos(\theta) =$ x coord on unit circle	$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$	$\sec(\theta) = \frac{1}{\cos(\theta)}$
$\sin(\theta) =$ y coord on unit circle	$\cot(\theta) = \frac{\cos(\theta)}{\sin(\theta)}$	$\csc(\theta) = \frac{1}{\sin(\theta)}$

Important Values

Note: All well-known values of trig and inverse trig can be obtained from the unit circle.

Random Examples:

$\cos(\pi) = -1$

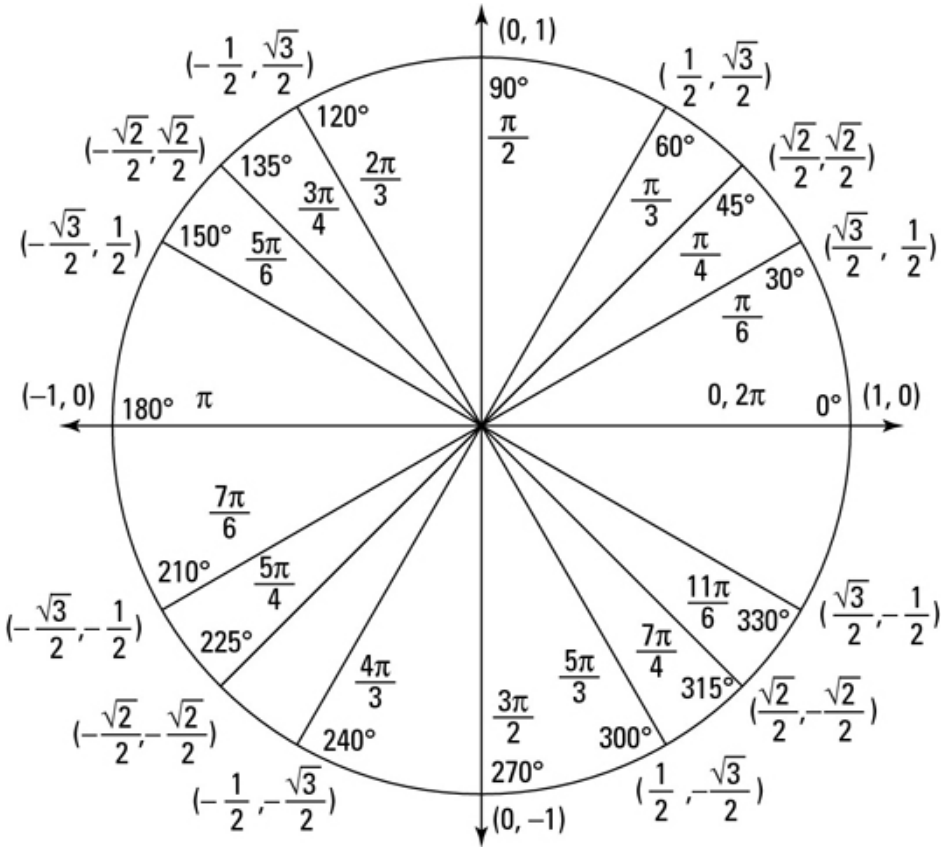
$\sin(4\pi/3) = -\sqrt{3}/2$

$\tan\left(\frac{5\pi}{3}\right) = \frac{\sin\left(\frac{5\pi}{3}\right)}{\cos\left(\frac{5\pi}{3}\right)} = \frac{-\sqrt{3}/2}{1/2} = -\sqrt{3}$

$\csc\left(\frac{7\pi}{6}\right) = \frac{1}{\sin\left(\frac{7\pi}{6}\right)} = \frac{1}{-1/2} = -2$

$\cos^{-1}(1/2) = \frac{\pi}{3}$

$\sin^{-1}(1) = \frac{\pi}{2}$



Important Identities

Unit Circle Identity: $\sin^2(\theta) + \cos^2(\theta) = 1$, and dividing this by $\cos^2(\theta)$ gives $\tan^2(\theta) + 1 = \sec^2(\theta)$

Half-Angle Identities: $\cos^2(x) = \frac{1}{2}(1 + \cos(2x))$, $\sin^2(x) = \frac{1}{2}(1 - \cos(2x))$, $\sin(x)\cos(x) = \frac{1}{2}\sin(2x)$