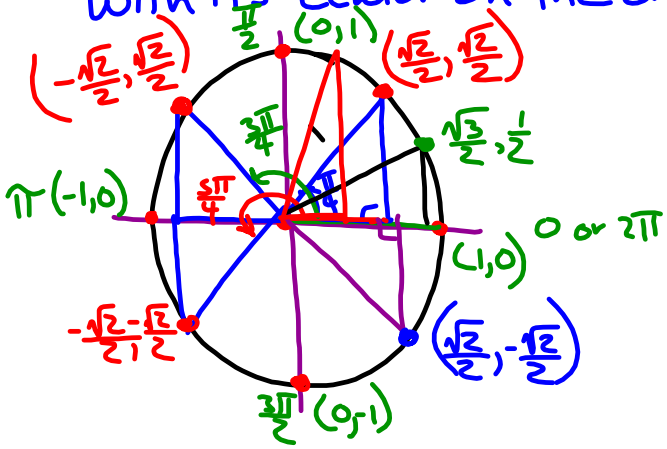
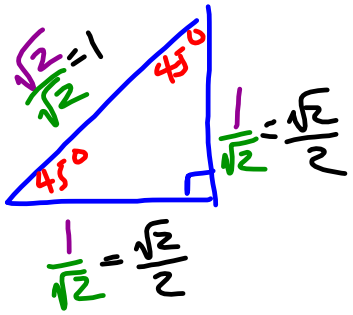
Section 7.3: The Unit Circle

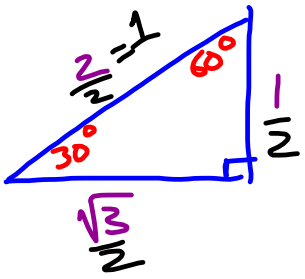
The Unit Circle is a circle of Radius = 1 with its center on the origin.



$0 < \theta < 90^\circ$

Favorite Right Triangles



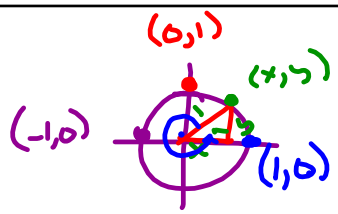


radius = hypotenuse = 1

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

$\cos\theta = x$ $\sec\theta = \frac{1}{x}$

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



$\sin(0) = 0$ $\sin\left(\frac{\pi}{2}\right) = 1$ $\sin(\pi) = 0$

$\cos(0) = 1$ $\cos(90^\circ) = 0$ $\cos(\pi) = -1$

$\tan(0) = \frac{0}{1} = 0$ $\tan\left(\frac{\pi}{2}\right) = \frac{1}{0} = \text{Und.}$ $\tan(360^\circ) = \frac{0}{1} = 0$

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

$\cos\theta = x$ $\sec\theta = \frac{1}{x}$

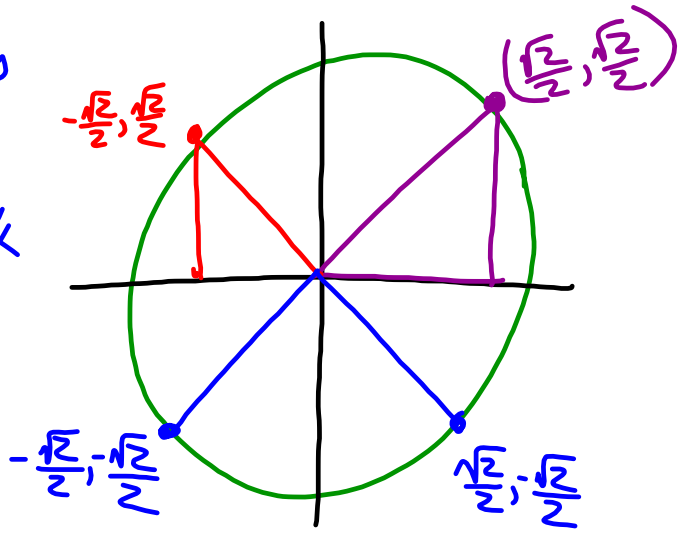
$\tan\theta = \frac{y}{x}$ $\cot\theta = \frac{y}{x}$

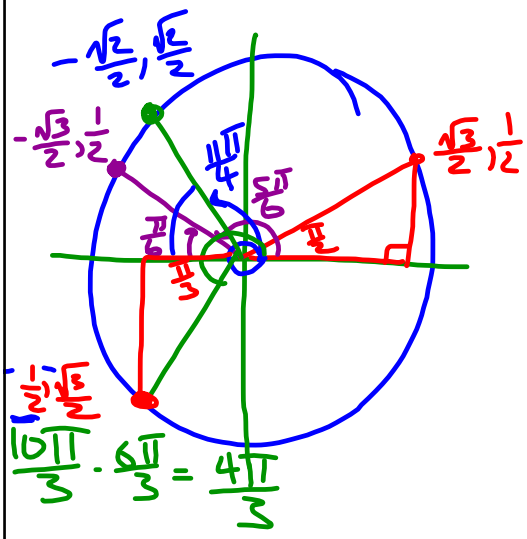
$\sin\frac{\pi}{4} = \frac{\sqrt{2}}{2}$

$\cos\frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$

$\sin\frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$

$\tan 315^\circ = -1$





$\sin\frac{\pi}{6}=\frac{1}{2}$

$\cos\frac{5\pi}{6}=-\frac{\sqrt{3}}{2}$

$\sin\frac{11\pi}{4}=\sin\frac{3\pi}{4}=\frac{\sqrt{2}}{2}$

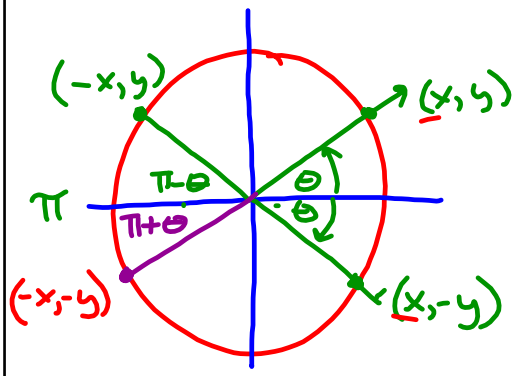
$\cos\frac{11\pi}{4}=\cos\frac{3\pi}{4}=-\frac{\sqrt{2}}{2}$

$\tan\frac{11\pi}{4}=\tan\frac{3\pi}{4}=-1$

$\sin\frac{10\pi}{3}=\sin\frac{4\pi}{3}=-\frac{\sqrt{3}}{2}$

$\cos\frac{10\pi}{3}=-\frac{1}{2}$

$\tan\frac{10\pi}{3}=\frac{-\sqrt{3}/2}{-1/2}=+\sqrt{3}$



$\sin\theta=-\sin(-\theta)$ ← odd

$\cos\theta=\cos(-\theta)$ ← even

$\tan\theta=-\tan(-\theta)$ ← odd

y/x $-y/x$

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

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

$\tan(\theta)=\tan(\pi+\theta)$

y/x $-y/x$