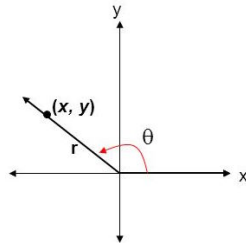


### Trigonometry in the Coordinate Plane

**Definitions of Trigonometric Functions of Any Angle**

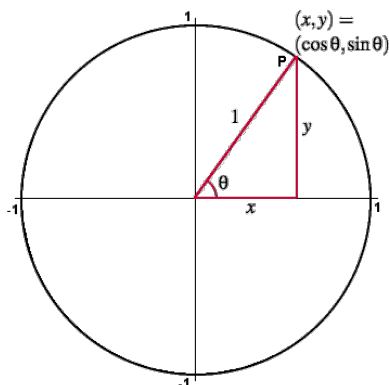
Let  $\theta$  be an angle in standard position with  $(x, y)$  a point on the terminal side of  $\theta$  and  $r = \sqrt{x^2 + y^2}$

$\sin \theta = \frac{y}{r}$	$\csc \theta = \frac{r}{y}$
$\cos \theta = \frac{x}{r}$	$\sec \theta = \frac{r}{x}$
$\tan \theta = \frac{y}{x}$	$\cot \theta = \frac{x}{y}$



### Unit circle

The unit circle is the circle of radius 1 (i.e.,  $r = 1$ ) centered at  $(0, 0)$ . Hence for a point  $(x, y)$  on the unit circle at angle  $\theta$ ,  $x = \cos \theta$  and  $y = \sin \theta$ :



Here are the coordinates of the points on the unit circle at a number of “special angles”:

