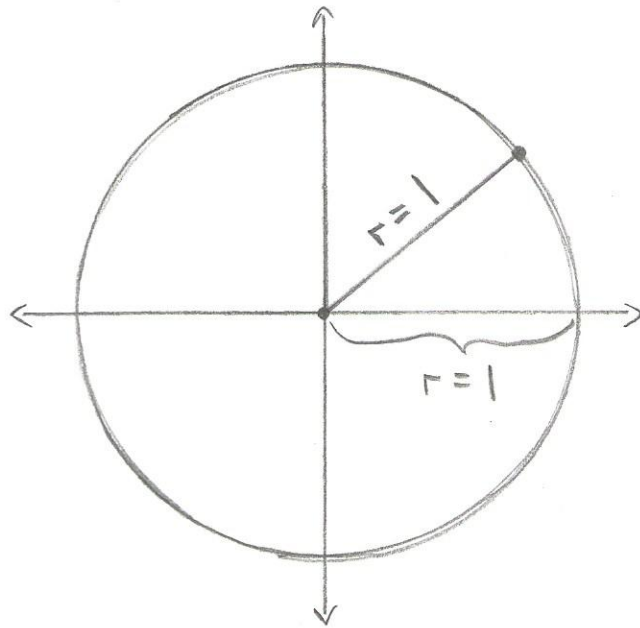
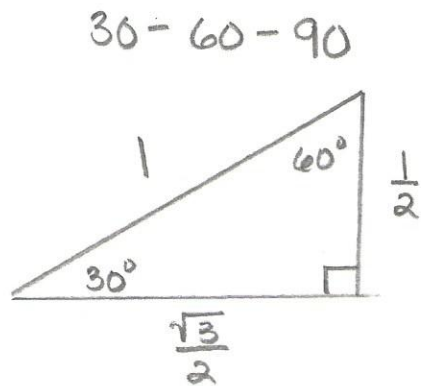


The Unit Circle

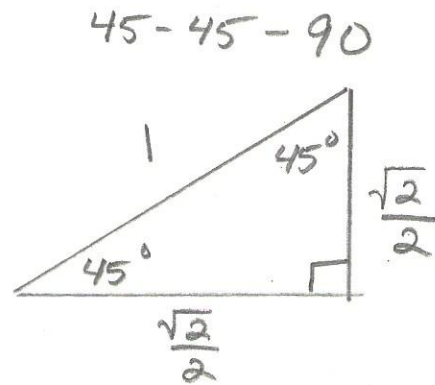


- * The unit circle is a special circle in which the radius is 1 unit.
 - ∴ meaning that any point on the \odot is a distance of 1 from the origin.
- * There are special angles within the unit circle that we give exact values.
 - these values for the angles are based off of our 30-60-90 & 45-45-90 triangles with a hypotenuse of 1.

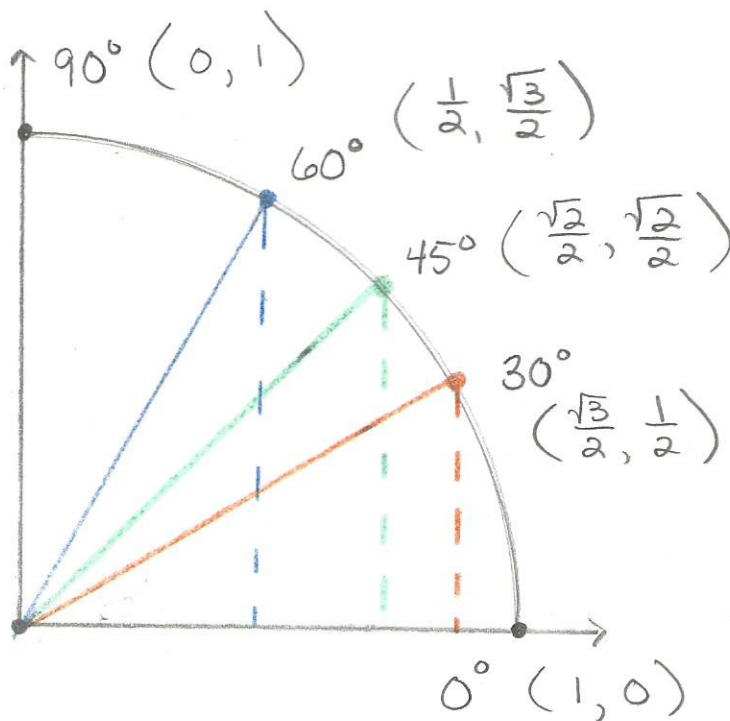
The Unit Circle



Given
Hypotenuse



* Given hypotenuse of 1 for the triangles, the sides are determined.



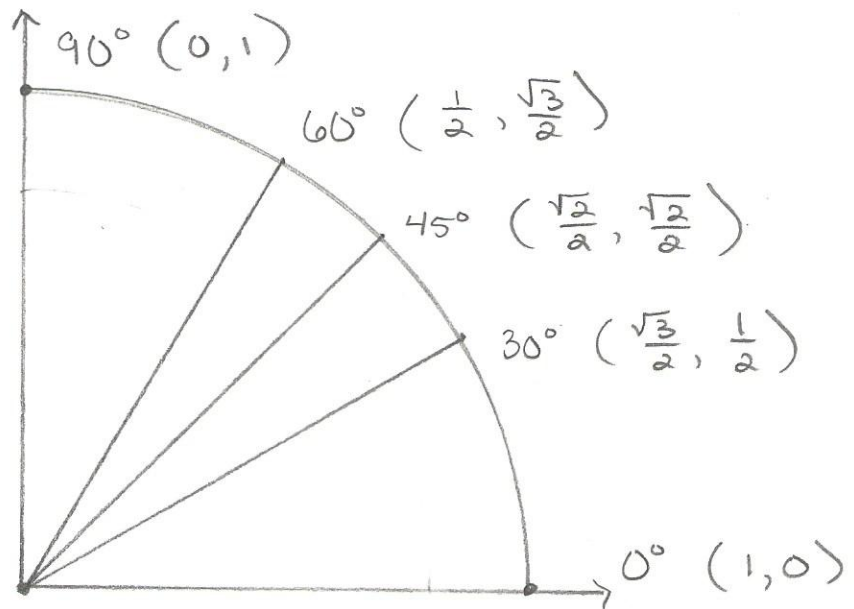
* within Quad I there are three Δ 's derived from the Δ 's above.

* the degree measure is the distance to the x-axis.

* Each point on the circle at the degree has a specific coordinate derived from the triangles above

* Each coordinate is based off of moving "x" spaces right & "y" spaces up.

The Unit Circle



* From the special right Δ 's, we can derive the \cos & \sin values for each special \angle .

\therefore within the unit circle, the relationships are $\cos \theta = x$ & $\sin \theta = y$

ex: $\cos 30^\circ = \frac{\sqrt{3}}{2}$ or $\sin 45^\circ = \frac{\sqrt{2}}{2}$

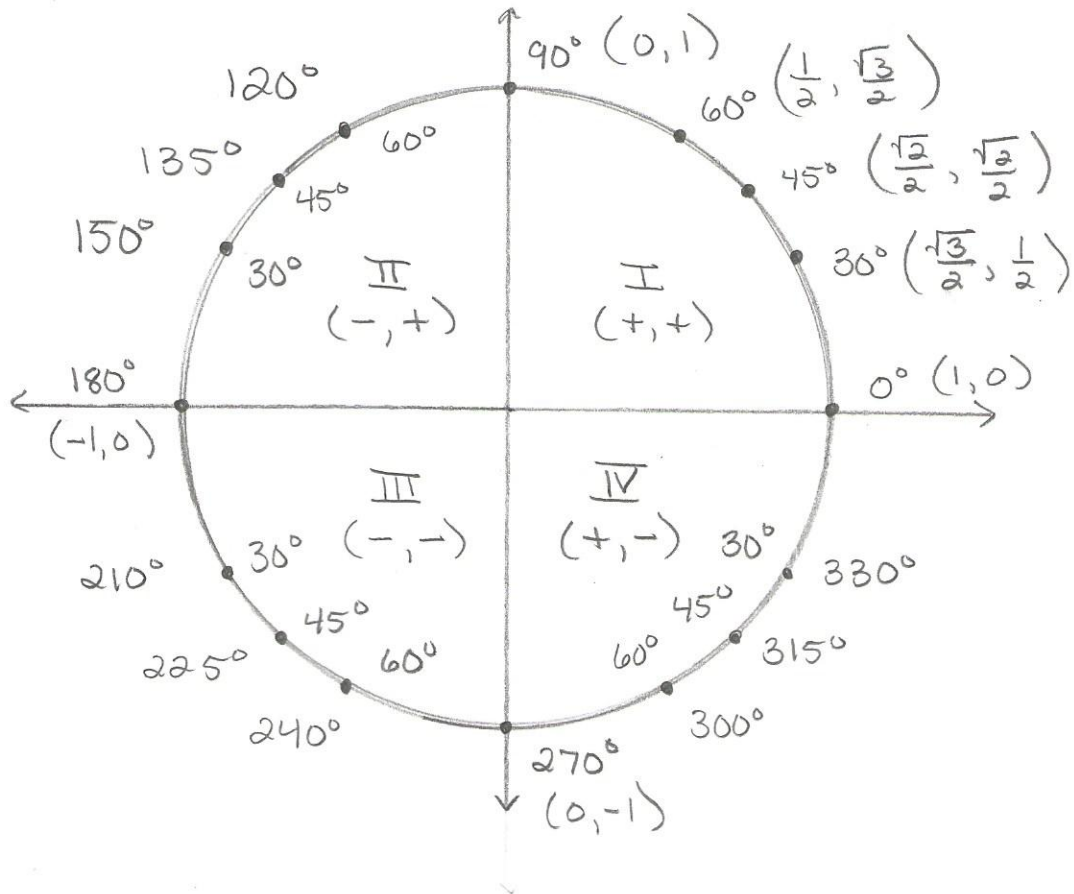
• these are exact values

\therefore the coord pair (x, y) can relate to (\cos, \sin)

* Unit Δ ratios:

$\sin \theta = y$	$\csc \theta = \frac{1}{y}$	} think reciprocal
$\cos \theta = x$	$\sec \theta = \frac{1}{x}$	
$\tan \theta = \frac{y}{x}$	$\cot \theta = \frac{x}{y}$	

The Unit Circle

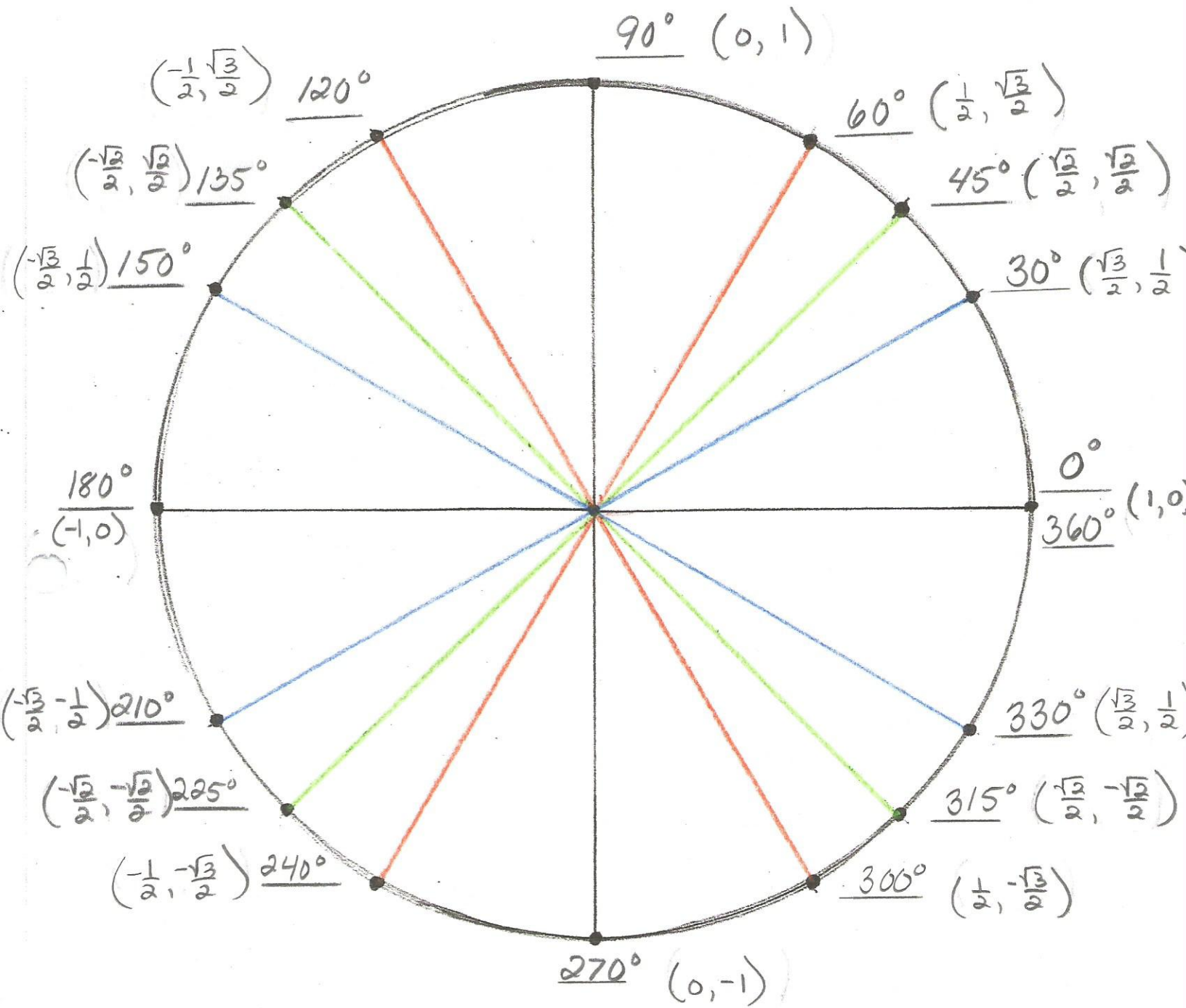


* Quad II, III, & IV are all based on Quad I. Quad I gives you reference \angle 's for the other Quads. The coords are the same value, only signs will change.

ex: $\cos 135^\circ = -\frac{\sqrt{2}}{2}$ but negative since Q II
(45°)

$\csc 300^\circ = \frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$ but negative since Q IV
↑ (60°)
reciprocal of sin

The Unit Circle



The Unit Circle