Section 13: Trigonometry – Part 1

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| The following Mathematics Florida Standards will be covered in this section: |
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| **F-TF.1.1 -** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle; Convert between degrees and radians. |
| **F-TF.1.2 -** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. |

Section 13 – Trigonometry – Part 1
Section 13 – Topic 1
The Unit Circle – Part 1
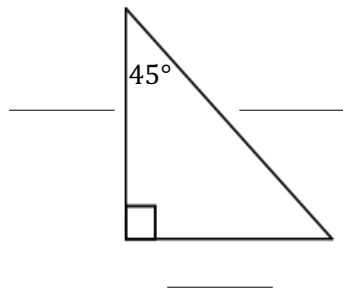
Let's review trigonometric ratios.
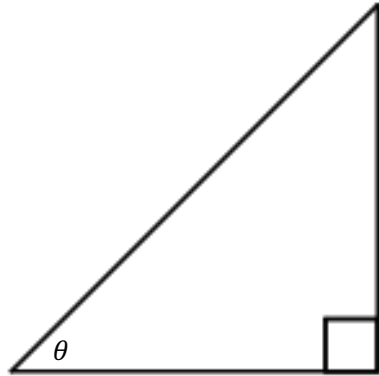
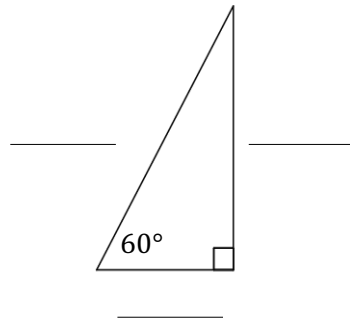Label the hypotenuse, opposite, and adjacent legs of θ.

$\sin \theta = \underline{\quad\quad}$ $\cos \theta = \underline{\quad\quad}$ $\tan \theta = \underline{\quad\quad}$

Let's review special right triangles.

$45° - 45° - 90°$

$45°$

$30° - 60° - 90°$

$60°$

Consider the following diagram of a unit circle.
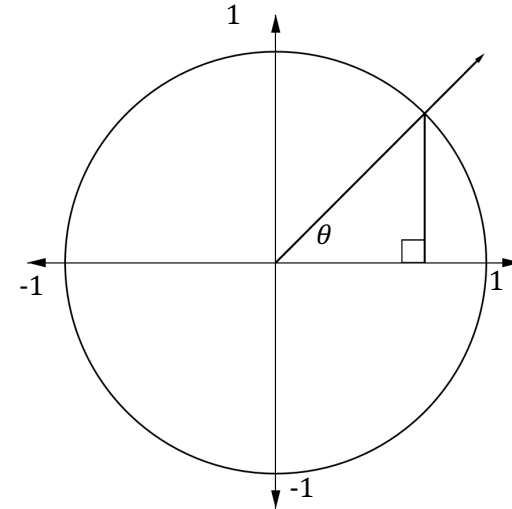
> ➢ The unit circle has a radius of _____ that can be used to determine values of _____ functions.

> ➢ The unit circle is centered at the _____.

> ➢ _____ is the angle formed by the positive _____ and a ray that intersects the unit circle (also called the _____ side).

> ➢ The angle measure is _____ if the rotation of the terminal side is counterclockwise and _____ if the rotation of the terminal side is clockwise.

> ➢ If the base of the right triangle is x, and the height is y, the ordered pair at which the angle intersects the unit circle is _____.

What is the length of the hypotenuse of the unit circle?

Write the trigonometric functions for θ in the unit circle.

$\sin\theta = \underline{\hspace{3cm}}$ $\cos\theta = \underline{\hspace{3cm}}$ $\tan\theta = \underline{\hspace{3cm}}$

We can use these trigonometric functions to find $\underline{\hspace{3cm}}$
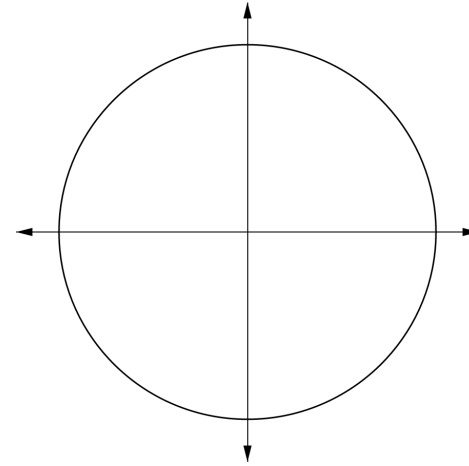$\underline{\hspace{2cm}}$ on the unit circle.

Use the unit circle to complete the following chart by filling in the sign of each function's value in each quadrant.

Trigonometric Function	I	II	III	IV
$\sin\theta$				
$\cos\theta$				
$\tan\theta$				

Let's Practice!

1. Find the coordinates of the point of intersection of the unit circle and a 30° angle.
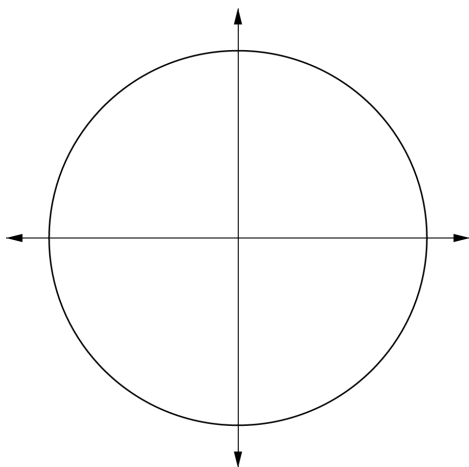

2. Find the coordinates of the point of intersection of the unit circle and a −60° angle.
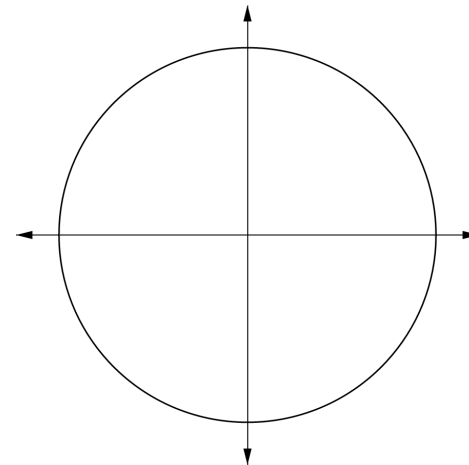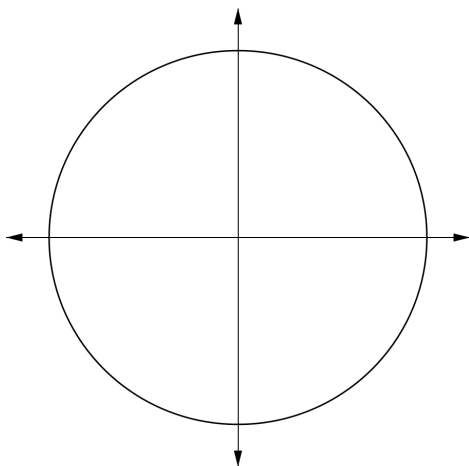
Try It!

3. Find the coordinates of the point of intersection of the unit circle and a 45° angle.

4. Find the coordinates of the point of intersection of the unit circle and a −30° angle.

1. Draw triangle(s) in the unit circle below to illustrate an angle that has a value of $\cos \theta = -\frac{\sqrt{3}}{2}$.