

13-2 Angles and the Unit Circle

Objectives:

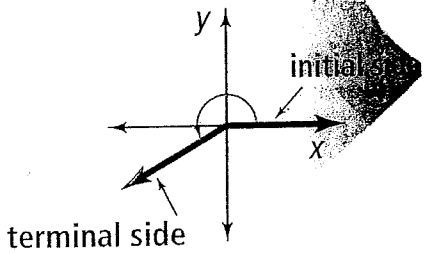
- To work with angles in standard position.
- To find coordinates of points on the unit circle.

Common Core Standard

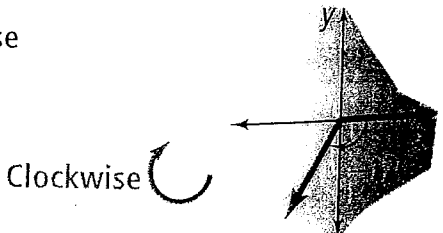
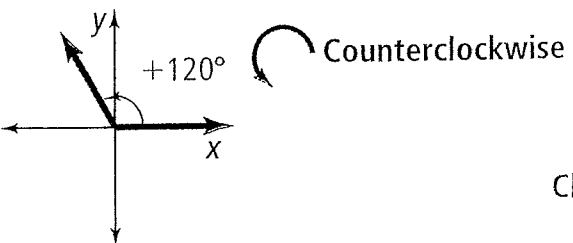
Prepares for F.TF.2 Explain how the unit circle... enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed clockwise around the unit circle.

An angle in the coordinate plane is in _____ when the vertex is at the origin and one ray is on the positive x-axis. The ray on the x-axis is the _____ side of the angle. The other ray is the _____ side of the angle.

Standard Position

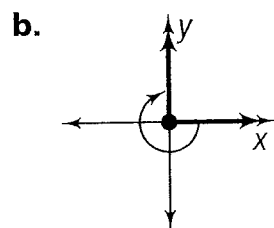
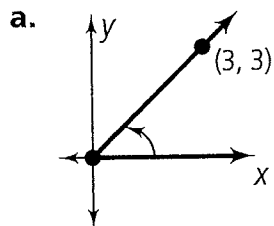


The measure of an angle in standard position is the amount of rotation from the initial side to the terminal side. The measure of an angle is _____ when the rotation from the initial side to the terminal side is in the counterclockwise direction. The measure is _____ when the rotation is clockwise.



Example 1: Measuring Angles in Standard Position

What is the measure of each angle?



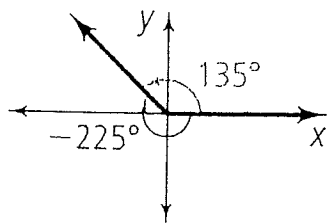
Example 2: Sketching Angles in Standard Position

What is a sketch of each angle in standard position?

a.) 100°

b.) -215°

Two angles in standard position are _____ angles if they have the same terminal side.



Example 3: Identifying Coterminal Angles

Multiple Choice. Which of the following angles is not coterminal with any of the other three?

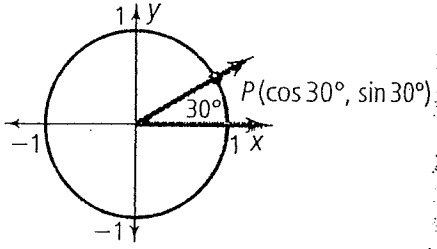
- a.) 750° b.) 30° c.) -330° d.) -540°

In a 360° angle, a point 1 unit from the origin on the terminal ray makes one full rotation about the origin. The resulting circle is a unit circle. The _____ has a radius of 1 unit and its center at the origin at the origin of the coordinate plane. Any right triangle formed by the radius of the unit circle has a hypotenuse of 1.

Take note

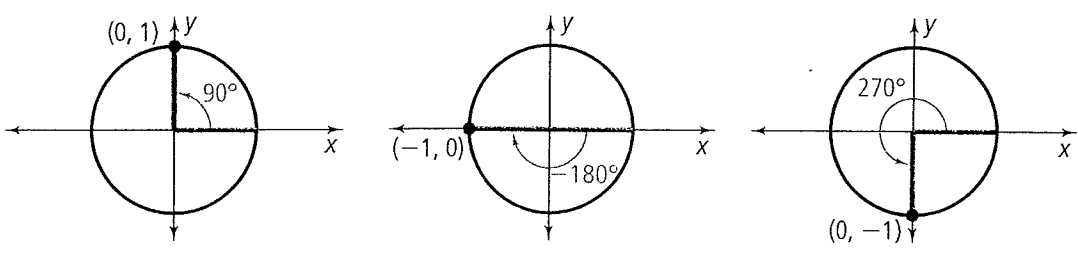
Key Concepts Cosine and Sine of an Angle

Suppose an angle in standard position has measure θ . The **cosine** of θ ($\cos \theta$) is the x -coordinate of the point at which the terminal side of the angle intersects the unit circle. The **sine** of θ ($\sin \theta$) is the y -coordinate.



Example 4: Finding Cosines and Sines of Angles

What are $\cos \theta$ and $\sin \theta$ for $\theta = 90^\circ$, $\theta = -180^\circ$, and $\theta = 270^\circ$?



Example 5: Finding Exact Values of Cosine and Sine

What are the cosine and the sine of the angle?

- a.) 135° b.) 300°

