

## Today's Plan:

**Learning Target (standard):** I will describe co-terminal angles and properties of trigonometric angles.

**Students will:** Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

**Teacher will:** Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

**Assessment:** Board work, homework check and homework assignment

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.378 #8-60 even

$$14) \frac{2\pi}{3}$$

$$16) \frac{11\pi}{6}$$

$$18) -\frac{\pi}{6}$$

$$20) \frac{3\pi}{2}$$

$$22) -\frac{5\pi}{4}$$

$$24) -\pi$$

$$26) 150^\circ$$

$$28) -120^\circ$$

$$30) 720^\circ$$

$$32) 75^\circ$$

$$34) -180^\circ$$

$$36) -135^\circ$$

$$38) s = 12 \text{ ft}$$

$$40) r = 24 \text{ cm}$$

$$42) \theta = \frac{4}{3}$$

$$44) s = 2\pi m$$

$$46) 1.274$$

$$48) -0.890$$

$$50) 3.491$$

$$52) 6.108$$

$$54) 180^\circ$$

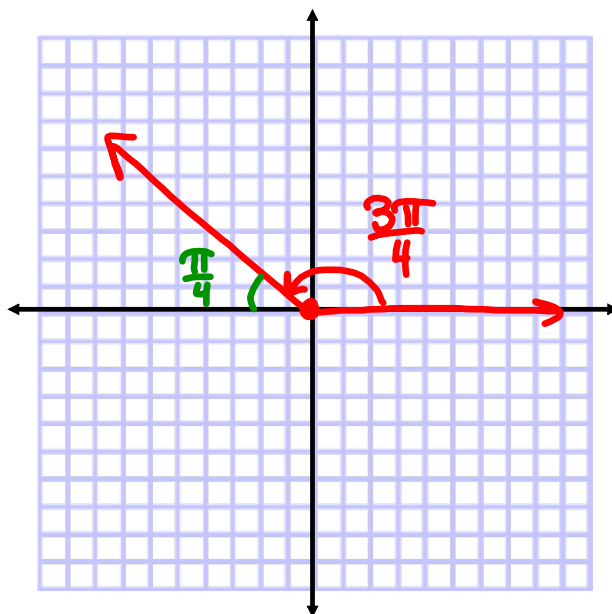
$$56) 42.972^\circ$$

$$58) 171.887^\circ$$

$$60) 81.028^\circ$$

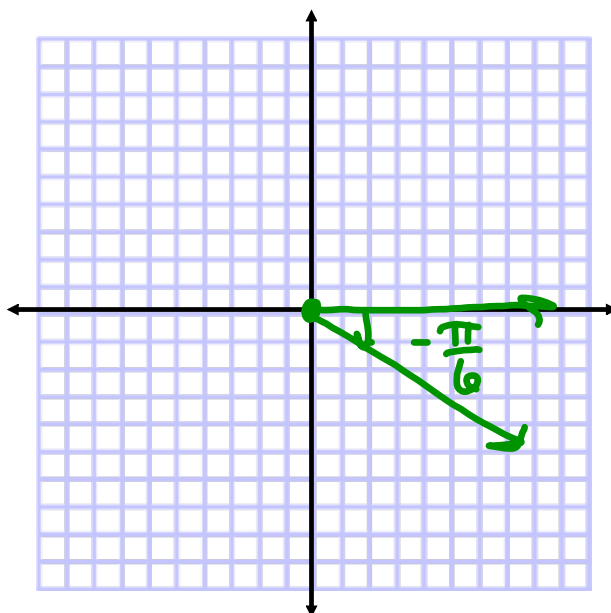
Draw the given angle.

$$\frac{3\pi}{4}$$



Draw the given angle.

$$-\frac{\pi}{6}$$



Convert the give angle to radians.

$$240^\circ \quad 240 \cdot 1^\circ = \frac{\pi}{180} \cdot 240$$

$$240^\circ = \frac{4\pi}{3}$$

$$-60^\circ \quad -60 \cdot 1^\circ = \frac{\pi}{180} \cdot -60$$

$$-60^\circ = -\frac{\pi}{3}$$

$$180^\circ \quad 180 \cdot 1^\circ = \frac{\pi}{180} \cdot 180$$

$$180^\circ = \pi$$

Convert the given angle to degrees.

$$-\frac{5\pi}{4} \quad -\frac{5\pi}{4} \cdot 1 = \frac{180^\circ}{\pi} \cdot -\frac{5\pi}{4}$$

$$-\frac{5\pi}{4} = -225^\circ$$

$$\frac{\pi}{12}$$

$$\frac{\pi}{12} \cdot 1 = \frac{180^\circ}{\pi} \cdot \frac{\pi}{12}$$

$$\frac{\pi}{12} = 15^\circ$$

$$-\frac{\pi}{6}$$

$$-\frac{\pi}{6} \cdot 1 = \frac{180^\circ}{\pi} \cdot -\frac{\pi}{6}$$

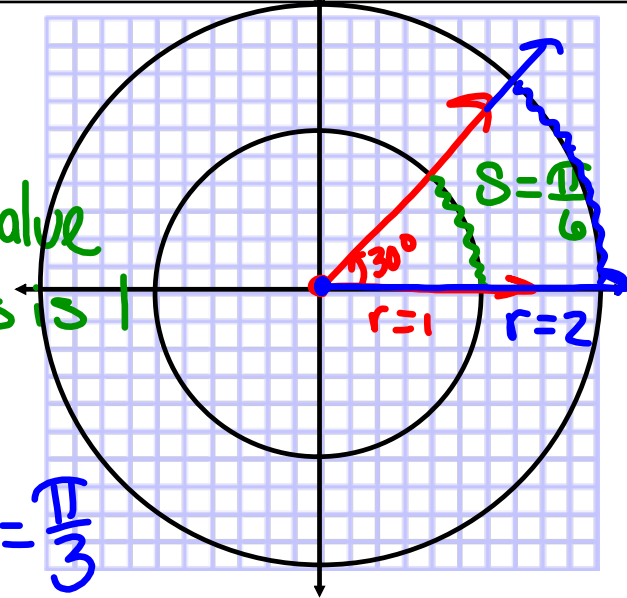
$$-\frac{\pi}{6} = -30^\circ$$

# Arc Length

$S =$  radian value  
when radius is 1

$$S = r \cdot \theta$$

$$S = 2 \left( \frac{\pi}{6} \right) = \frac{\pi}{3}$$



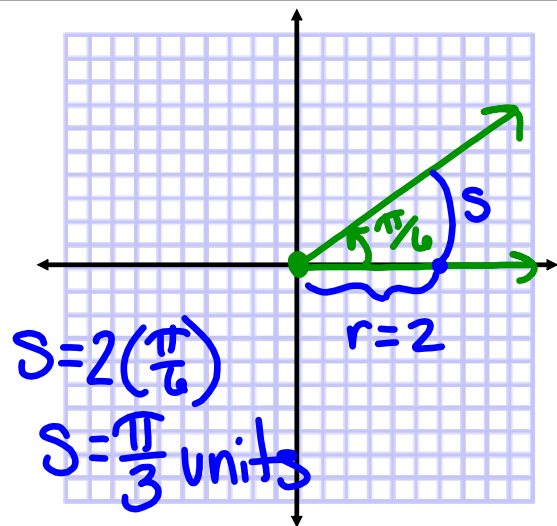
# Arc Length

$$s = r\theta$$

$s =$  arc length

$r =$  radius

$\theta =$  central angle in radians



Find the arc length when the central angle is  $30^\circ$  when the radius is 2.

$$30 \cdot 1^\circ = \frac{\pi}{180} \cdot 30$$

$$30^\circ = \frac{\pi}{6}$$

Find the missing value.

$$\theta = \frac{1}{3}$$

$$s = 2 \text{ feet}$$

$$r = ?$$

$$s = r\theta$$

$$2 = \frac{1}{3}r$$

$$r = 6 \text{ feet}$$

Find the missing value.

$$\theta = 120^\circ$$

$$s = ?$$

$$r = 3 \text{ inches}$$

$$120 \cdot 1^\circ = \frac{\pi}{180} \cdot 120$$

$$120^\circ = \frac{2\pi}{3}$$

$$s = r\theta$$

$$s = 3 \left( \frac{2\pi}{3} \right)$$

$$s = 2\pi \text{ inches}$$

Describe what a radian is and how it is used to find an arc length.

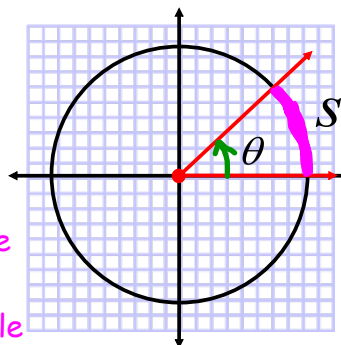
A radian measures the distance around a unit circle

- the distance around a circle is the circumference of the circle
- the circumference of a unit circle is  $2\pi$
- $2\pi$  radians are equivalent to  $360^\circ$

**Arc Length**

$$s = r\theta$$

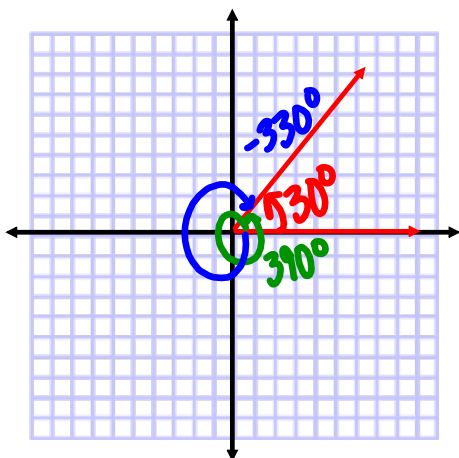
- arc length measures a distance from the initial side of the angle to the terminal side of the angle on any circle



- a radian measures the same distance on a unit circle so the radius of the circle is multiplied by the number of radians to give the final arc length

**Coterminal Angles:**

- trigonometric angles (in standard position) that share the same terminal side



\*ALL trig values of coterminal angles will be equal

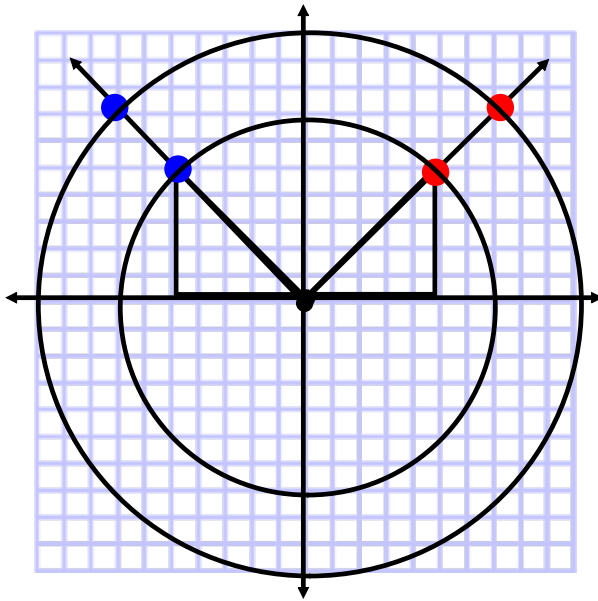
If  $\theta = 30^\circ$ , find 3 positive and 3 negative angles that will be coterminal to  $\theta$

(+)  $\theta + 360^\circ n$

(-)  $\theta - 360^\circ n$

*n = # of rotations*

### Properties of Trigonometric Angles:



$$\sin \theta =$$

$$\sin \theta_1 =$$

$$\cos \theta =$$

$$\cos \theta_1 =$$

$$\tan \theta =$$

$$\tan \theta_1 =$$

## Assignment:

Exercises 2.1 #1-19 odd, 35-41 odd

\* Write on a separate sheet of paper or in your notebook with ALL necessary work and units. \*

\* On #9-19 odd, tell whether the angle is in standard position, describe why or why not and indicate whether the angle is positive or negative. \*