

# Assignment

## Write

Write a definition for *arc length* and for *radian* in your own words.

## Remember

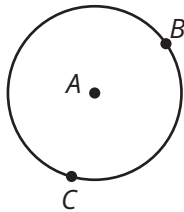
All circles are similar figures.

The formula for arc length can be written as  $s = \frac{m}{360^\circ} \cdot 2\pi r$ , where  $s$  is the arc length and  $m$  is the central angle measure.

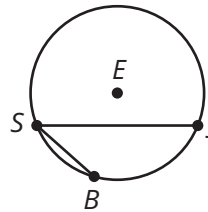
The length of the intercepted arc of the central angle is proportional to the radius.

## Practice

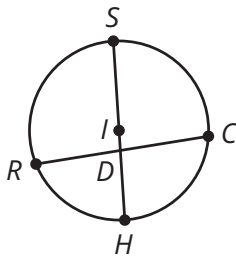
1. In circle  $A$  shown, describe the difference between the measure of minor arc  $BC$  and the length of major arc  $BC$ .



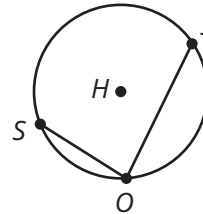
2. In circle  $E$  shown, the radius of the circle is 16 centimeters and  $m\angle JSB$  is  $40^\circ$ . Determine the length of  $\widehat{JB}$ .



3. In circle  $I$  shown, the radius is 6 millimeters and  $m\widehat{HC}$  is  $80^\circ$ .



4. In circle  $H$  shown, the length of  $\widehat{SJ}$  is  $24\pi$  centimeters and  $m\angle JOS$  is  $80^\circ$ .

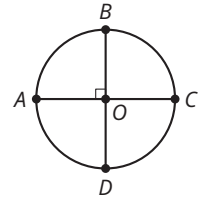
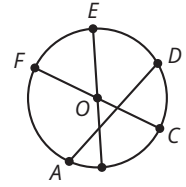


Determine the length of a diameter of circle  $H$ .

- Determine the length of  $\widehat{SC}$  in millimeters.
  - Determine the measure of  $\widehat{SC}$  in radians.
- If  $\theta = \frac{\pi}{3}$  and  $r = 3$ , what is the length of the intercepted arc?
  - If  $r = 8$  and the intercepted arc length is  $6\pi$ , what is the measure of the central angle?
  - If  $r = 6$  and the measure of the central angle is  $\frac{2\pi}{3}$ , what is the length of the intercepted arc?
  - If  $r = 6$  and the intercepted arc length is  $4\pi$ , what is the measure of the central angle?
  - The measure of a central angle is  $80^\circ$ . The length of the radius is 40 mm. Determine the length of the intercepted arc.
  - The measure of a central angle is  $110^\circ$ . The length of the radius is 15 ft. Determine the length of the intercepted arc.

## Stretch

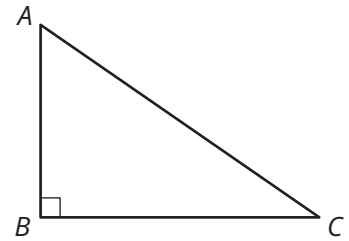
- In circle  $O$  shown, the radius is 8 millimeters,  $m\widehat{BD}$  is  $110^\circ$ , and  $m\widehat{AB}$  is  $35^\circ$ .
  - Determine the length of  $\widehat{FA}$  in millimeters.
  - Determine the measure of  $\widehat{FA}$  in radians.
- Circle  $O$  is divided into 4 equal sectors. The radius of the circle is 4 centimeters.
  - Determine the area of the circle.
  - Determine the area of each sector. Explain your reasoning.
  - How does the ratio of the area of each sector to the total area of the circle compare to the ratio of the measure of the central angle to the total number of degrees in a circle? Explain your reasoning.



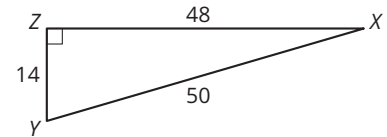
## Review

- Complete the table of ratios given  $\triangle ABC$ .

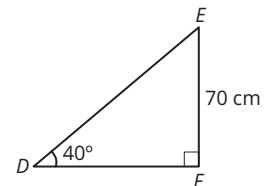
Reference Angle	sin	cos	tan	csc	sec	cot
$A$			$\frac{5}{12}$			
$C$						



- Sasha is putting a new roof on her backyard shed. The shed is 5 meters wide. Sasha is considering roof heights between 1.3 and 1.5 meters. Draw a picture to model this situation. Then, determine the minimum and maximum angle of elevation of the roof beams. Round the measures to the nearest tenth.
- Determine the ratios  $\frac{\text{opposite}}{\text{hypotenuse}}$ ,  $\frac{\text{adjacent}}{\text{hypotenuse}}$  and  $\frac{\text{opposite}}{\text{adjacent}}$  using  $\angle X$  as the reference angle. Write your answers as fractions.



- Determine side length  $DF$ . Round your answer to the nearest hundredth.



- Solve for  $x$ .

a.  $\frac{-5x + 30}{4} = 10x - 15$

b.  $-5x - 18 = -25x - 4$