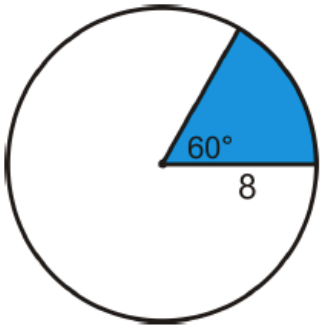
5.5 Sectors and Arc Length

Objective: Students will be able to find the area and perimeters of circles

Area of a Sector

A sector is a portion of the total area of a circle



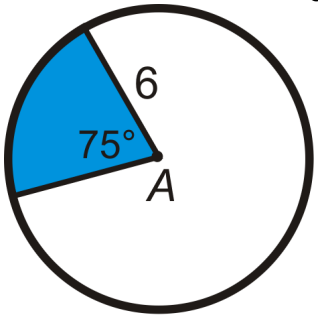
Think like a slice of pizza

Formula: Area of a Sector

$$Area = \frac{\theta}{360} \times \pi r^2$$

$$Area = \frac{(\quad)}{360} \times \pi(\quad)^2$$

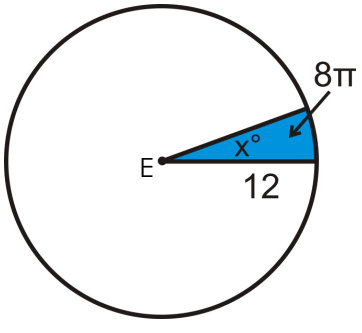
In the diagram below of circle A, the radius has a length of 6 and the measure of ∠A = 75. Find the area of the shaded region.



$$Area = \frac{\theta}{360} \times \pi r^2$$

$$Area = \frac{(\quad)}{360} \times \pi(\quad)^2$$

In the diagram below of circle E, the area of the shaded sector is 8π and the length of the radius is 12. Determine the m∠E.

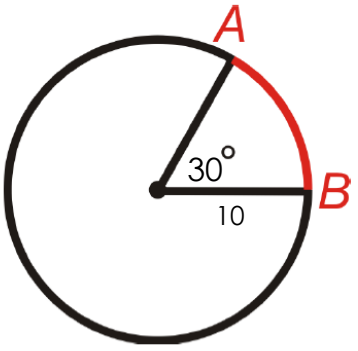


$$Area = \frac{\theta}{360} \times \pi r^2$$

$$(\quad) = \frac{(\quad)}{360} \times \pi(\quad)^2$$

Arc length

An arc length is a portion of the total circumference

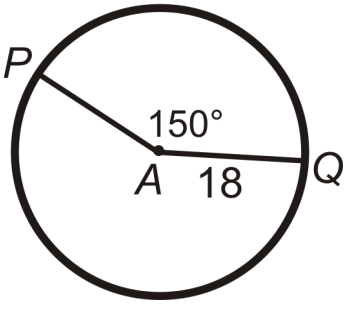


Formula: Arc Length

$$l = \frac{\theta}{360} 2\pi r$$

$$l = \frac{(\quad)}{360} 2\pi (\quad)$$

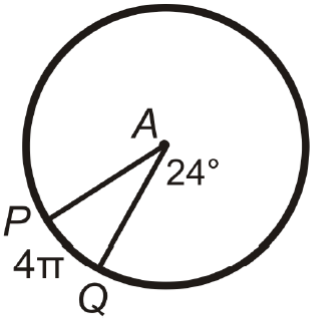
Circle A has a radius of 18 and m∠PAQ = 150°. Find the length of $\overset{\frown}{PQ}$



$$l = \frac{\theta}{360} 2\pi r$$

$$l = \frac{(\quad)}{360} 2\pi (\quad)$$

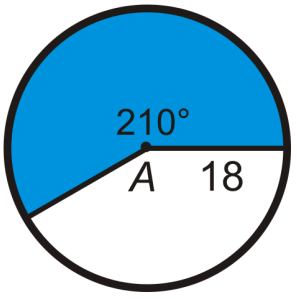
In the diagram below of circle A, the length of arc $\overset{\frown}{PQ}$ is 4π and length of m∠PAQ = 24°. Determine the length of the radius of the circle.



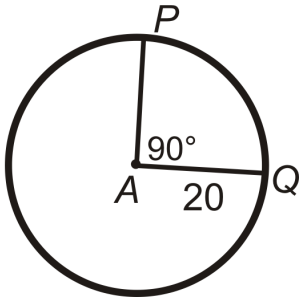
$$l = \frac{\theta}{360} 2\pi r$$

$$(\quad) = \frac{(\quad)}{360} 2\pi (\quad)$$

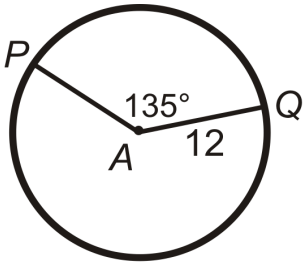
Independent Practice



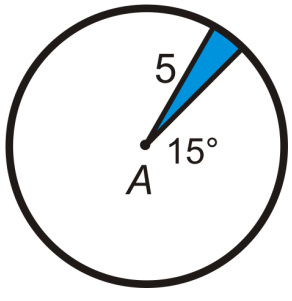
Find the area of the shaded region



Find the length of arc PQ

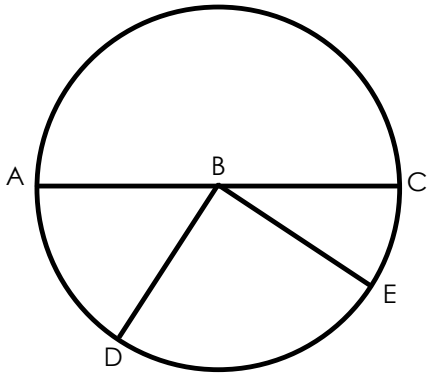


Find the length of arc PQ

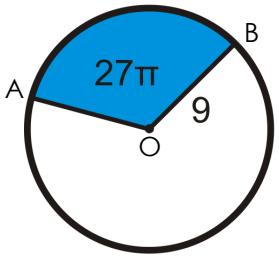


Find the area of the shaded region

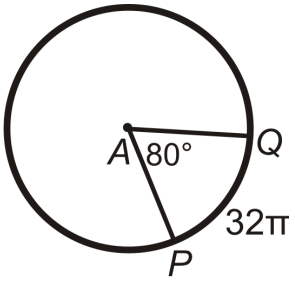
The diameter of of circle B is $\overline{AC}$, which has a length of 20cm. The m∠ABD = 75° and the m∠CBE = 35°. Find the length of arc $\overset{\frown}{DE}$.



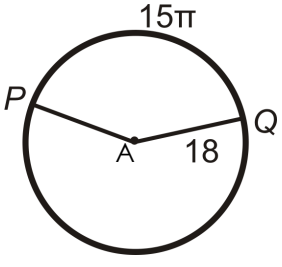
In the diagram below of circle O, the area of the shaded sector AOB is 27π and length of OB = 9. Determine the $\angle AOB$



In the diagram below of circle A, the length of arc $\overset{\frown}{PQ}$ is 32π and $m\angle PAQ = 80°$. Determine the length of the radius of the circle.



In the diagram below of circle A, the length of arc $\overset{\frown}{PQ}$ is 15π and length of AQ = 18. Determine the measure of $\angle PAQ$



In the diagram below of circle E, the area of the shaded sector DEF is 16π and the length of the radius is 24. Determine the $m\angle E$