An arc has a length of 4π units and a radius of 6 units. What is the angle of the sector in radians?

$$\frac{1}{3}\cancel{\frac{4\pi}{12\pi}} = \frac{x}{360}$$

$$\frac{1}{3} = \frac{x}{360}$$

$$360 = 3x \quad x = 120$$

$$\cancel{\frac{120\pi}{180}}^{2}_{3} \quad \frac{2\pi}{3}$$

Suppose a circle with an 11.4 inch arc intercepted by the central angle and a radius that is 3 inches long. Determine the measure of the central angle in radians.

$$\frac{11.4}{6\pi} \times \frac{x}{360}$$

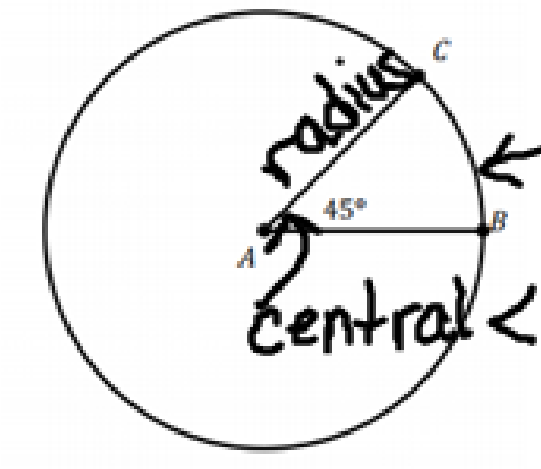
$$\frac{4,104}{18.8496} = \frac{18.8496x}{18.8496}$$

$$217.7235 = x$$

$$217.7235\left(\frac{\pi}{180}\right)$$

1.2π

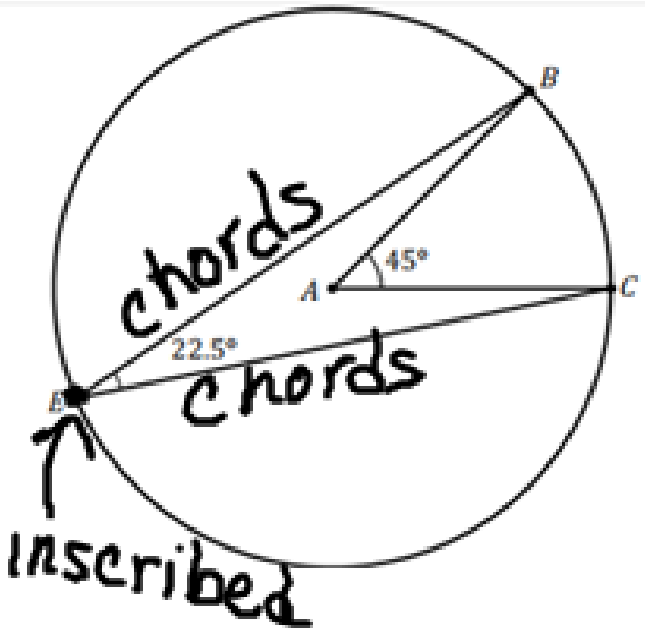
The measure of an arc on a circle is equal to the degree measure of the central ∠ that intercepts the arc.



intercepted arc

What is $m\overset{\frown}{BC}$? 45°

Consider the figure below. $\angle E$ is an inscribed < angle. $\overset{\frown}{BC}$ is an intercepted arc by both the central angle $\angle A$ and the inscribed angle.



Define the inscribed angle.

inscribed < = ½ central <

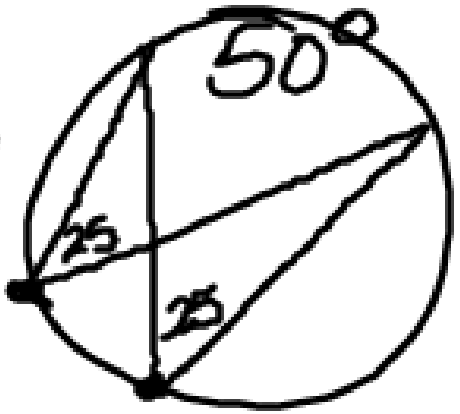
Compare and contrast the inscribed angle and the intercepted arc.

Inscribed = ½ intercepted arc

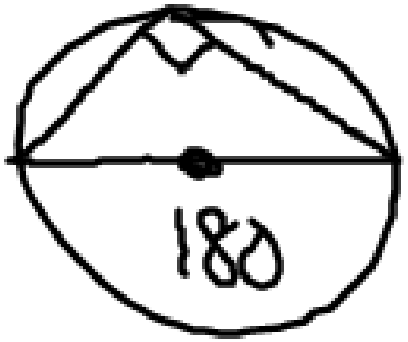
Inscribed Angle Conjectures

In a circle, the measure of an inscribed angle is ½ the measure of the central angle with the same intercepted arc.

In a circle, two inscribed angles with the same intercepted arc are congruent

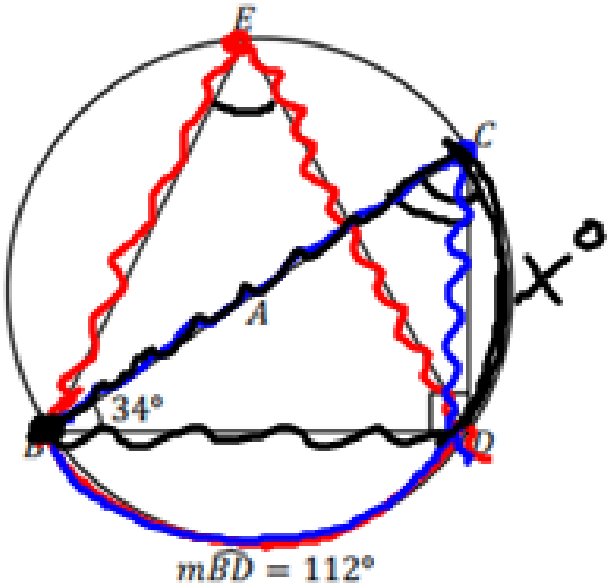


Any angle inscribed∠ in a semicircle is a Right angle.



Practice:

Consider circle A in the following figure, and find $m\angle BED, m\angle BCD, \& \ m\overset{\frown}{CD}$.



$m\angle BED = \frac{112}{2} = 56°$

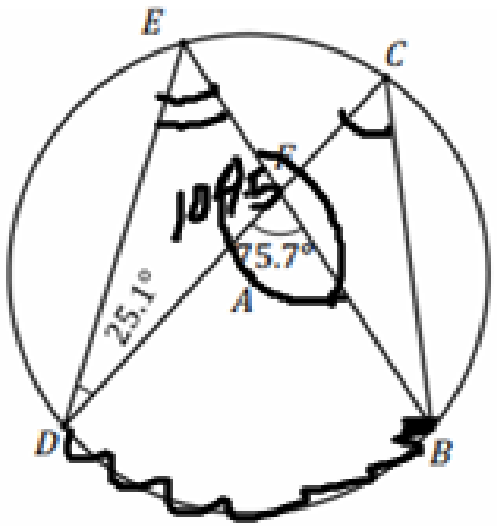
$m\angle BCD = 56°$

$34(2) = 68°$

$= m\overset{\frown}{CD}$

Your turn:

Consider circle A in the following figure, and find $m\angle BCF, mBED, \& \ m\widehat{DB}$.



180
− 75.7
104.3
+25.1
129.4

180
− 129.4
50.6

∠BCF = 50.6

∠BED = 50.6

50.6(2)
101.2 = $\overset{\frown}{DB}$