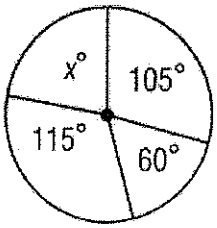
March 24, 2014

10.3 Warm-Up

Find the value of x.

1. 

$x + 105 + 60 + 115 = 360$

$x + 280 = 360$

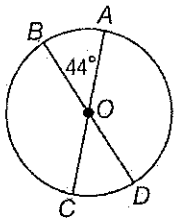
$-280 \quad -280$

$x = 80$

2. $\overline{BD}$ and $\overline{AC}$ are diameters of $\odot O$. Identify each arc as a *major arc*, *minor arc*, or *semicircle* of the circle. Then find its measure.

$m\overset{\frown}{BC} = 136°$

Minor



$180 - 44 = 136$

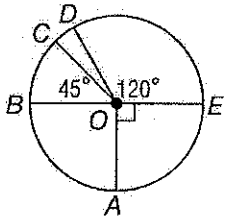
3. Use $\odot O$ to find the length of each arc. Round to the nearest hundredth.

$\text{Arc Length} = \frac{\text{Angle}}{360} \cdot 2\pi r$

$\overset{\frown}{DE}$ if the radius is 2 meters

$\overset{\frown}{DE} = \frac{120}{360} \cdot 2\pi 2$

4.18m

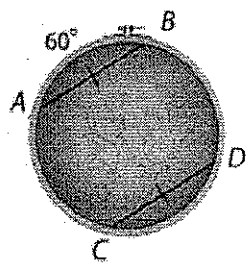


10.3 Arcs and Chords

Target: Use properties of arcs and Chords to find missing lengths.

Real-World Example 1 Use Congruent Chords to Find Arc Measure

CRAFTS In the embroidery hoop, $\overline{AB} \cong \overline{CD}$ and $m\overset{\frown}{AB} = 60$. Find $m\overset{\frown}{CD}$.



$\cong$ Chords $\rightarrow$ $\cong$ Arcs

$m\overset{\frown}{CD} = 60°$

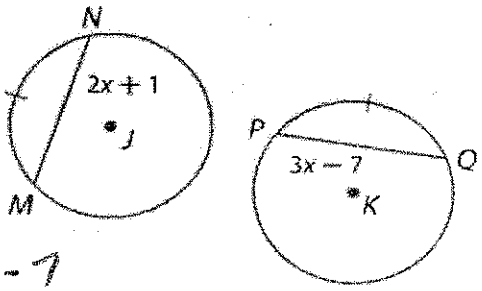
Guided Practice

1. If $m\overset{\frown}{AB} = 78$ in the embroidery hoop, find $m\overset{\frown}{CD}$.

$m\overset{\frown}{CD} = 78°$

Example 2 Use Congruent Arcs to Find Chord Lengths

ALGEBRA In the figures, $\odot J \cong \odot K$ and $\overset{\frown}{MN} \cong \overset{\frown}{PQ}$. Find PQ.



≅ Arcs → ≅ Chords

$2x + 1 = 3x - 7$

$-2x \quad -2x$

$1 = 1x - 7$

$+7 \quad +7$

$8 = 1x$

$x = 8$

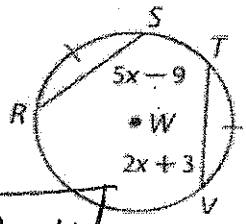
$PQ = 3(8) - 7$

$24 - 7$

$\boxed{PQ = 17}$

Guided Practice

2. In $\odot W$, $\overset{\frown}{RS} \cong \overset{\frown}{TV}$. Find RS.



$5x - 9 = 2x + 3$

$-2x \quad -2x$

$3x - 9 = 3$

$+9 \quad +9$

$3x = 12$

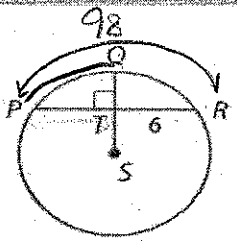
$x = 4$

$RS = 5(4) - 9$

$\boxed{RS = 11}$

Example 3 Use a Radius Perpendicular to a Chord

In $\odot S$, $m\overset{\frown}{PQR} = 98$. Find $m\overset{\frown}{PQ}$.



$\frac{98}{2} = \boxed{49°}$

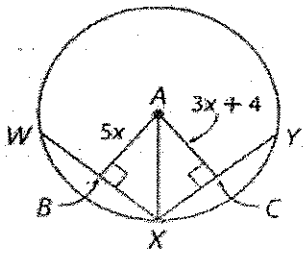
Guided Practice

3. In $\odot S$, find $\overline{PR}$.

$6 \cdot 2 = \boxed{12}$

Example 5 Chords Equidistant from Center

ALGEBRA In $\odot A$, $WX = XY = 22$. Find AB.



$5x = 3x + 4$

$-3x \quad -3x$

$2x = 4$

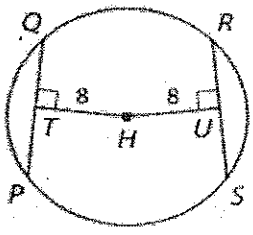
$x = 2$

$AB = 5(2)$

$\boxed{AB = 10}$

Guided Practice

5. In $\odot H$, $PQ = 3x - 4$ and $RS = 14$. Find x.



$3x - 4 = 14$

$+4 \quad +4$

$3x = 18$

$\boxed{x = 6}$