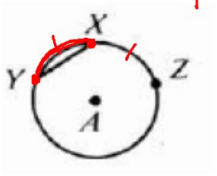
Geometry **Sec. 9-4 Arcs and Chords** Date Feb 21

In circle A, chord $\overline{XY}$ cuts off two arcs, $\overset{\frown}{XY}$ and $\overset{\frown}{XZY}$.
The minor arc, $\overset{\frown}{XY}$, is the **arc of chord** $\overline{XY}$.

If $\overset{\frown}{XY} \cong \overset{\frown}{XZ}$, then X is the **midpoint** of $\overset{\frown}{YZ}$.



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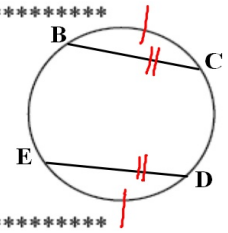
In the same circle or in congruent circles, congruent arcs have congruent chords.



If $\overset{\frown}{BC} \cong \overset{\frown}{ED}$, then $\overline{BC} \cong \overline{ED}$.

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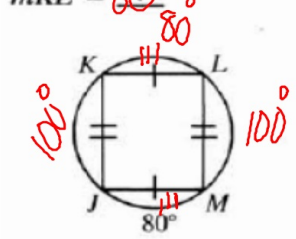
Ex. 1 $m\overset{\frown}{JK} =$ 100, $m\overset{\frown}{LM} =$?100
$m\overset{\frown}{KL} =$ 80?



$\frac{360-160}{2} = \frac{200}{2} = 100$

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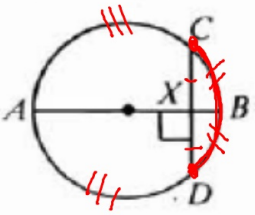
A diameter (or radius) that is perpendicular to a chord bisects the chord and its arc.



If $\overline{AB} \perp \overline{CD}$
then $\overline{CX} \cong \overline{XD}$ and $\overset{\frown}{CB} \cong \overset{\frown}{BD}$
(also: $\overset{\frown}{AC} \cong \overset{\frown}{AD}$)

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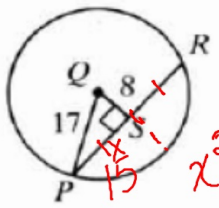
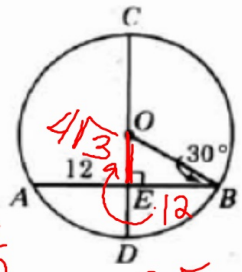
Ex. 2 $PR =$?30



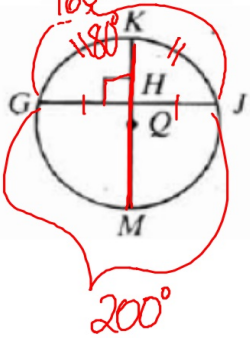
$x^2 + 8^2 = 17^2$
$\sqrt{x^2} = \sqrt{225}$
$x = 15$

Ex. 3 $OB = \frac{8\sqrt{3}}{} = 2 \cdot 4\sqrt{3}$



$\frac{12\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{12\sqrt{3}}{3}$

Ex. 4 $m\overset{\frown}{GMJ} = 200$
$m\overset{\frown}{GK} =$? 80



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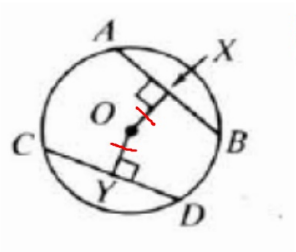
In the same circle or in congruent circles, congruent chords are equidistant from center.



If $\overline{AB} \cong \overline{CD}$,
then $OX = OY$.
(distances =)

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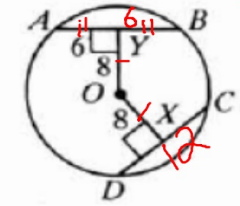
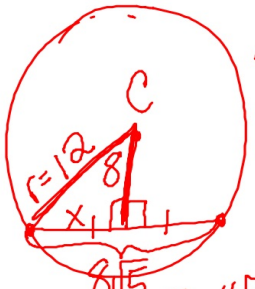
Ex. 5 $DC = \underline{?}$



AB=DC

Ex. 6 In a circle with radius 12, a chord is 8 units from center. How long is the chord?



$x^2 + 8^2 = 12^2$
$\sqrt{x^2} = \sqrt{80}$
$\sqrt{4}\sqrt{20}$
$2\sqrt{4}\sqrt{5}$
$2 \cdot 2\sqrt{5}$
$x = 4\sqrt{5}$