

Unit 6 Chords & Arcs of Circles

SWBAT solve for unknown variables using theorems about chords and arcs of circles.

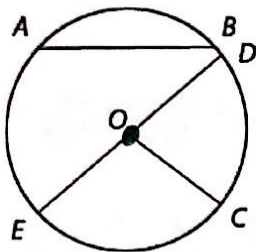
Any segment with end points that are the center and a point on the circle is a radius.

The given point is called the center. This point names the circle.

Any segment with endpoints that are on a circle is called a chord.

EX1: Name the circle, a radius, a chord, and a diameter of the circle.

* secant: hits \odot 2x's

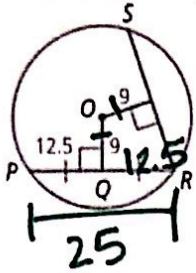


Circle: $\odot O$
 Radius: $\overline{OD}, \overline{OE}, \overline{OC}$
 Chord: $\overline{AB}, \overline{AC}$
 Diameter: \overline{ED}

**Since a diameter is composed of two radii, then $d = 2r$ and $r = d/2$

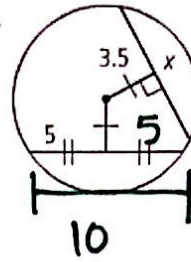
Theorem:	In My Own Words...	
Within a circle or in congruent circles, chords equidistant from the center or centers are congruent. If $OE = OF$, then $\overline{AB} \cong \overline{CD}$.	Same distance from center means chords are the same length	
Within a circle or in congruent circles, congruent central angles have congruent arcs. If $\angle AOB \cong \angle COD$, then $\widehat{AB} \cong \widehat{CD}$.	same angles means same arc	
Within a circle or in congruent circles, congruent central angles have congruent chords. If $\angle AOB \cong \angle COD$, then $\overline{AB} \cong \overline{CD}$.	same angle means same chord	
Within a circle or in congruent circles, congruent chords have congruent arcs. If $\overline{AB} \cong \overline{CD}$, then $\widehat{AB} \cong \widehat{CD}$.	same chord means same arc	

EX2: What is the length of RS?



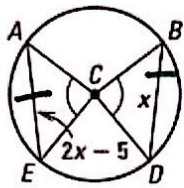
$$\boxed{RS = 25}$$

EX3: Solve for x.



$$\boxed{x = 10}$$

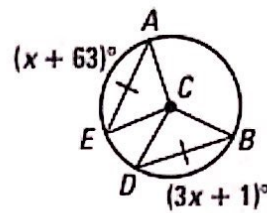
EX4: Solve for x.



$$2x - 5 = x$$

$$\boxed{x = 5}$$

EX5: Solve for x.



$$x + 63 = 3x + 1$$

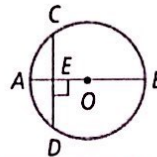
$$\boxed{x = 31}$$

Theorem:

In a circle, if a diameter is perpendicular to a chord, then it bisects the chord and its arc.

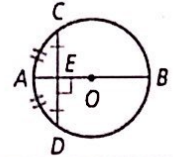
If ...

\overline{AB} is a diameter and $\overline{AB} \perp \overline{CD}$



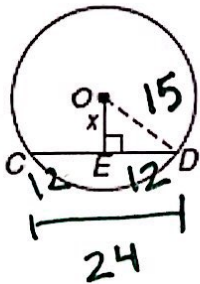
Then ...

$\overline{CE} \cong \overline{ED}$ and $\widehat{CA} \cong \widehat{AD}$



EX6: In $\odot O$, $\overline{CD} \perp \overline{OE}$, $OD = 15$, and $CD = 24$.

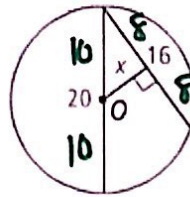
Find x



$$12^2 + x^2 = 15^2$$

$$\boxed{x = 9}$$

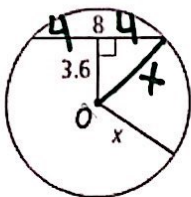
EX7: Find the value of x.



$$x^2 + 8^2 = 10^2$$

$$\boxed{x = 6}$$

EX8: Find the value of .



$$4^2 + 3.6^2 = x^2$$

$$\boxed{x = 5.381}$$