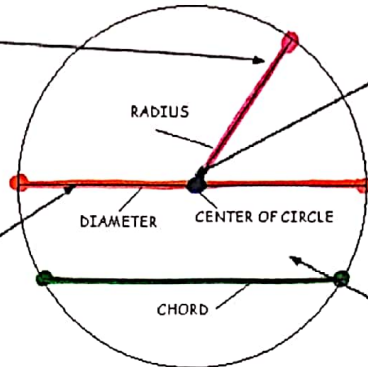


GUIDED NOTES: Chords and Arcs of Circles

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

A chord that passes through the center is a diameter of a circle.

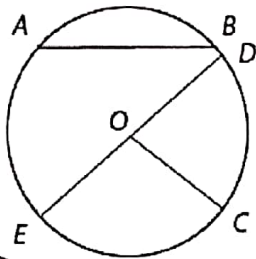


The given point is called the center.

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.

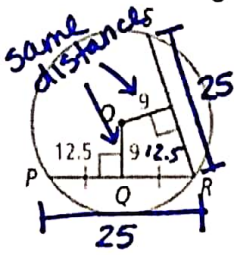


Circle: ⊙ O
 Radius: \overline{OC} , \overline{OD} , \overline{OE}
 Chord: \overline{AB} , \overline{ED}
 Diameter: \overline{ED}

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

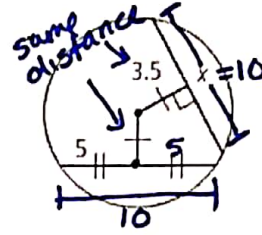
Theorem:	In My Own Words...	
Within a circle or in congruent circles, chords equidistant from the center or centers are congruent. If $OE = OF$, then $\overline{AB} \cong \overline{CD}$.	same distance from center means chords are equal length.	
Within a circle or in congruent circles, congruent central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

EX2: What is the length of RS?



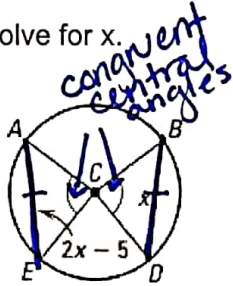
RS = 25

EX3: Solve for x.



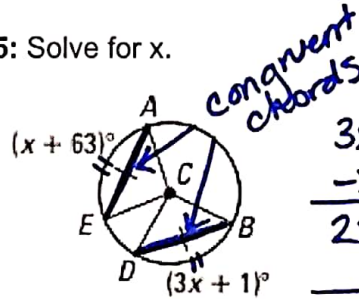
x = 10

EX4: Solve for x.



$$\begin{aligned} 2x - 5 &= x \\ -2x & \quad -2x \\ \hline -5 &= -x \\ -1 & \quad -1 \\ \hline 5 &= x \end{aligned}$$

EX5: Solve for x.



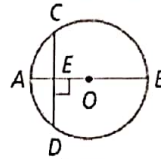
$$\begin{aligned} 3x + 1 &= x + 63 \\ -x & \quad -x \\ \hline 2x + 1 &= 63 \\ -1 & \quad -1 \\ \hline 2x &= 62 \\ \frac{2x}{2} &= \frac{62}{2} \\ x &= 31 \end{aligned}$$

Theorem:

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

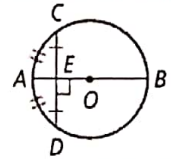
If ...

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



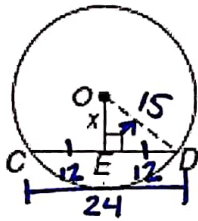
Then ...

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



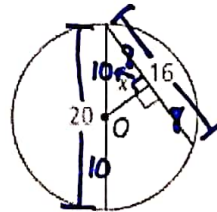
EX6: In $\odot O$, $\overline{CD} \perp \overline{OE}$, $OD = 15$, and $CD = 24$.

Find x



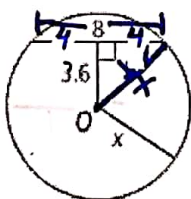
$$\begin{aligned} x^2 + 12^2 &= 15^2 \\ x^2 + 144 &= 225 \\ -144 & \quad -144 \\ \hline x^2 &= 81 \\ \sqrt{x^2} &= \sqrt{81} \\ x &= 9 \end{aligned}$$

EX7: Find the value of x.



$$\begin{aligned} x^2 + 8^2 &= 10^2 \\ x^2 + 64 &= 100 \\ -64 & \quad -64 \\ \hline x^2 &= 36 \\ \sqrt{x^2} &= \sqrt{36} \\ x &= 6 \end{aligned}$$

EX8: Find the value of x.



$$\begin{aligned} 4^2 + 3.6^2 &= x^2 \\ 16 + 12.96 &= x^2 \\ \sqrt{28.96} &= \sqrt{x^2} \\ 5.38 &= x \end{aligned}$$