

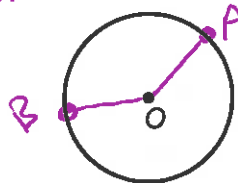
Circles

Radii

Things to know about \cong radii:

All radii are congruent

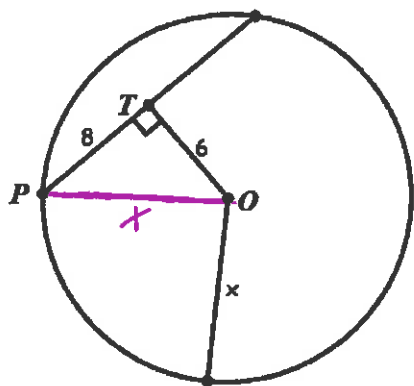
\overline{AO} is a radius
 \overline{BO} is a radius



$$\overline{AO} \cong \overline{BO}$$

Example:

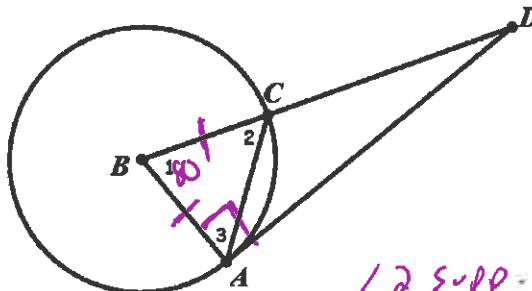
1. Solve for x.



$$\begin{aligned} 8^2 + 6^2 &= x^2 \\ 64 + 36 &= x^2 \\ 100 &= x^2 \end{aligned}$$

$$x = 10$$

2. $m\angle 1 = 80^\circ$, $m\angle BAD = 90^\circ$. Find $m\angle ACD$.



$$\overline{AB} \cong \overline{CB}$$

$$\Rightarrow \angle 2 \cong \angle 3$$

$$\Rightarrow 180 = 80 + 2(m\angle 2)$$

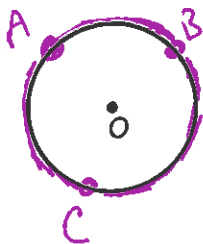
$$m\angle 2 = 50^\circ$$

$$m\angle 3 = 50^\circ$$

$$m\angle ACD = 180 - 50^\circ = 130^\circ$$

$\angle 2$ supp. to $\angle ACD$.

Arcs



\widehat{AB} is a minor arc.

\widehat{ACB} is a major arc.

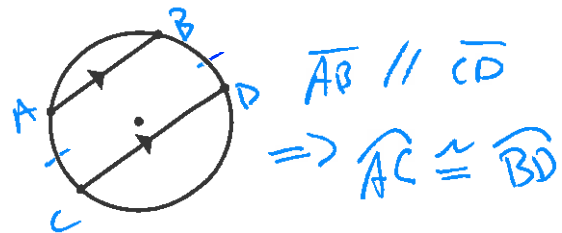
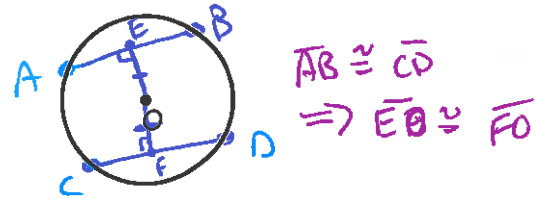
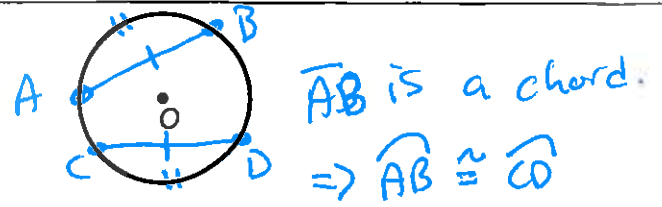
Chords

Things to know about \cong chords:

- \cong Chords make \cong Arcs.

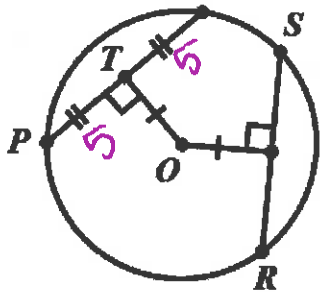
- \cong Chords are equidistant to the center

- \parallel Chords cut \cong Arcs.



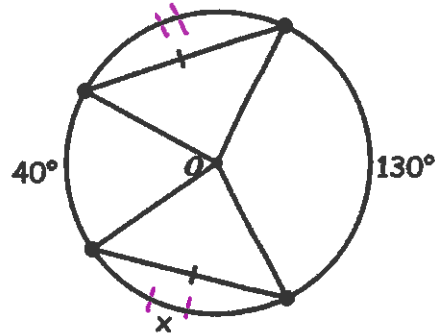
Examples:

1. $PT = 5$. Find SR .



$$SR = 5 + 5 = 10$$

2. Find x .

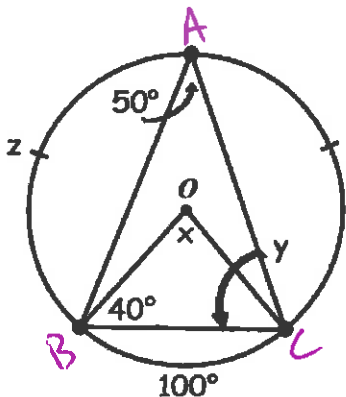


$$360 = 40 + 130 + 2x$$

$$190 = 2x$$

$$x = 95^\circ$$

3. Find x , y , and z .



$$\overline{AB} \cong \overline{AC}$$

$$\Rightarrow \angle ABC \cong \angle ACB$$

$$\Rightarrow 180 = 50 + 2y$$

$$y = 65^\circ$$

$$360 = 2z + 100$$

$$260 = 2z$$

$$z = 130^\circ$$

$$\overline{BO} \cong \overline{CO}$$

$$\Rightarrow \angle OBC \cong \angle OCB$$

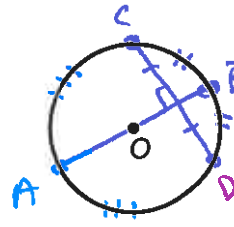
$$\Rightarrow 180 = x + 80$$

$$x = 100^\circ$$

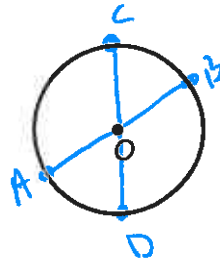
Diameters

Things to know about diameters:

- all diameters are \cong .
- diameter \perp to a chord also bisects the chord and the arcs
- diameter bisecting a chord is also \perp to the chord.



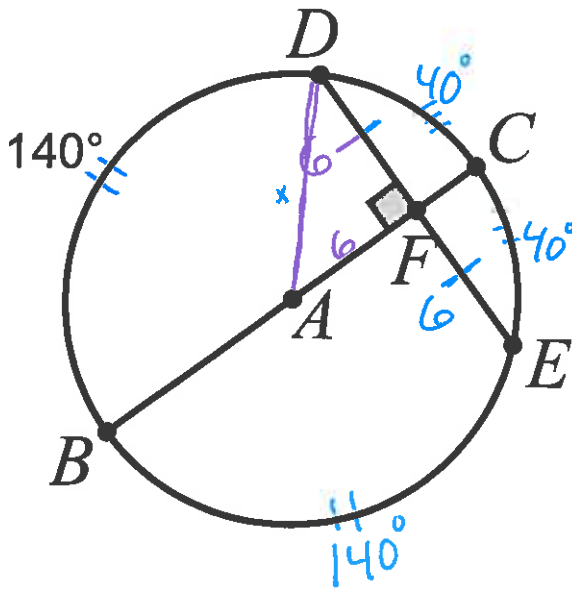
Diameter \overline{AB}
chord \overline{CD} .



$\overline{AB} \cong \overline{CD}$

Example:

$DE = 12$, $AF = 6$



Find:

a. $\widehat{CE} = \frac{360 - 140 - 140}{2} = 40^\circ$

b. $DF = \frac{12}{2} = 6$

c. $AB = AD \Rightarrow 6^2 + 6^2 = x^2$
 $36 + 36 = x^2$
 $72 = x^2$
 $x = \sqrt{72} = 6\sqrt{2}$

d. FC

$FC = AC - AF$
 $\Rightarrow FC = 6\sqrt{2} - 6$
 ≈ 2.5