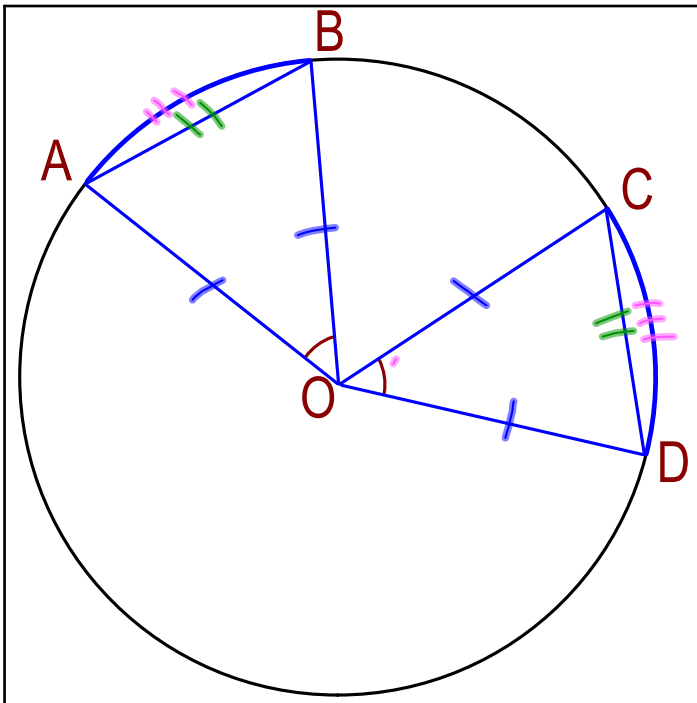
Geometry

Chapter 12

Section 12-2



Given: $\angle AOB \cong \angle COD$

$\triangle$s Isosceles

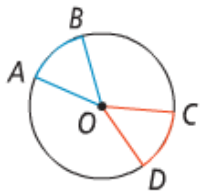
$\triangle AOB \cong \triangle COD$ by SAS

$\text{Length} = \frac{m\text{Arc}}{360}\pi d$

Theorem 12-4 and Its Converse

Theorem
Within a circle or in congruent circles, congruent central angles have congruent arcs.

Converse
Within a circle or in congruent circles, congruent arcs have congruent central angles.



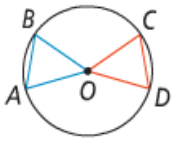
If $\angle AOB \cong \angle COD$, then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

If $\overset{\frown}{AB} \cong \overset{\frown}{CD}$, then $\angle AOB \cong \angle COD$.

Theorem 12-5

Theorem
Within a circle or in congruent circles, congruent central angles have congruent chords.

Converse
Within a circle or in congruent circles, congruent chords have congruent central angles.



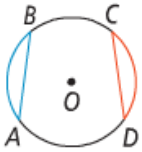
If $\angle AOB \cong \angle COD$, then $\overline{AB} \cong \overline{CD}$.

If $\overline{AB} \cong \overline{CD}$, then $\angle AOB \cong \angle COD$.

Theorem 12-6

Theorem
Within a circle or in congruent circles, congruent chords have congruent arcs.

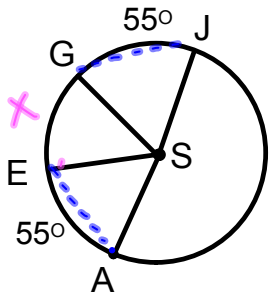
Converse
Within a circle or in congruent circles, congruent arcs have congruent chords.



If $\overline{AB} \cong \overline{CD}$, then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

If $\overset{\frown}{AB} \cong \overset{\frown}{CD}$, then $\overline{AB} \cong \overline{CD}$.

Using the theorems, what conclusions can you draw from the diagram?



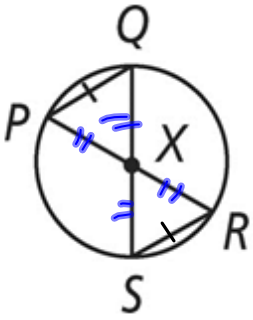
$\angle ESA \cong \angle GSJ$

$\overline{GJ} \cong \overline{EA}$

$\overset{\frown}{GJ} \cong \overset{\frown}{EA}$

$\overset{\frown}{EJ} \cong \overset{\frown}{AG}$

Using the theorems, what conclusions can you draw from the diagram?



$\overset{\frown}{PQ} \cong \overset{\frown}{RS}$ $\overline{PQ} \cong \overline{RS}$

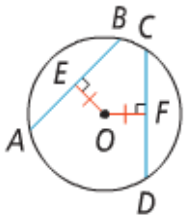
$\angle PXQ \cong \angle SXR$

$\angle P \cong \angle S$, $\angle P \cong \angle R$

Theorem 12-7

Theorem
Within a circle or in congruent circles, chords equidistant from the center or centers are congruent.

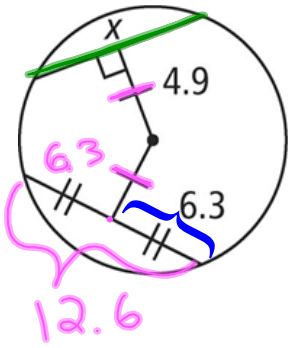
Converse
Within a circle or in congruent circles, congruent chords are equidistant from the center (or centers).



If $OE = OF$, then $\overline{AB} \cong \overline{CD}$.

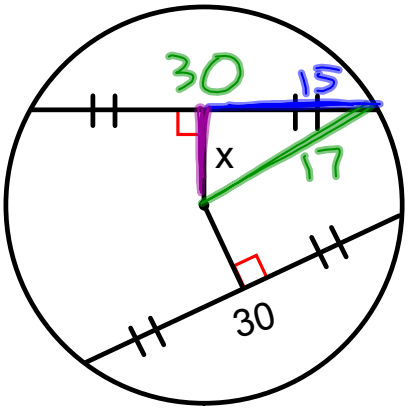
If $\overline{AB} \cong \overline{CD}$, then $OE = OF$.

What is the value of x?



x = 12.6

What is the value of x if r = 17?



$x^2+15^2=17^2$

$x^2+225=289$

$-225 \quad -225$

$x^2=64$

$x=8$

Theorem 12-8

Theorem	If . . .	Then . . .
In a circle, if a diameter is perpendicular to a chord, then it bisects the chord and its arc.	$\overline{AB}$ is a diameter and $\overline{AB} \perp \overline{CD}$	$\overline{CE} \cong \overline{ED}$ and $\overset{\frown}{CA} \cong \overset{\frown}{AD}$

Theorem 12-9

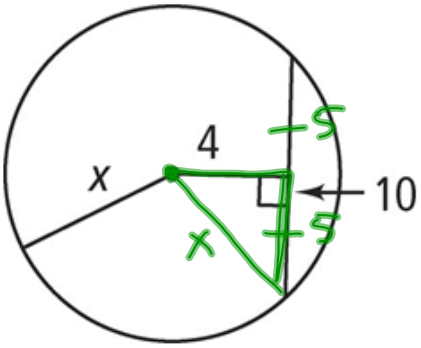
Theorem	If . . .	Then . . .
In a circle, if a diameter bisects a chord (that is not a diameter), then it is perpendicular to the chord.	$\overline{AB}$ is a diameter and $\overline{CE} \cong \overline{ED}$	$\overline{AB} \perp \overline{CD}$

Theorem 12-10

Theorem	If . . .	Then . . .
In a circle, the perpendicular bisector of a chord contains the center of the circle.	$\overline{AB}$ is the perpendicular bisector of chord $\overline{CD}$	$\overline{AB}$ contains the center of $\odot O$

$\overline{AB}$ diameter

What is the exact value of x?



$4^2+5^2=x^2$

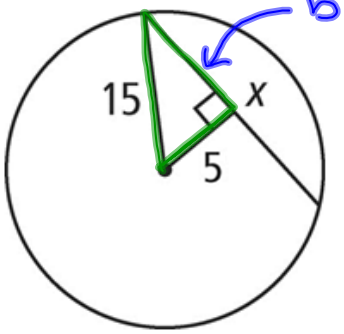
$16+25=x^2$

$\sqrt{41}=\sqrt{x^2}$

$\sqrt{41}=x$

What is the exact value of x?

$b=\frac{x}{2} \rightarrow 2b=x$



$5^2+b^2=15^2$

$25+b^2=225$

$b^2=200$

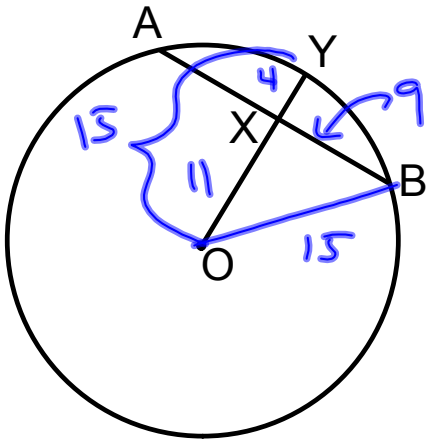
$b=\sqrt{200}$

$b=\sqrt{100}\cdot\sqrt{2}$

$b=10\sqrt{2}$

$x=2b=20\sqrt{2}$

Are AB and XY perpendicular?



OY = 15

BX = 9

XY = 4

$9^2+11^2=15^2$

$81+121=225$

$202 \neq 225 \rightarrow$ not $\perp$

Homework

Pages 776 - 777

7 - 17 odd, 20, 30 - 32 all, 34