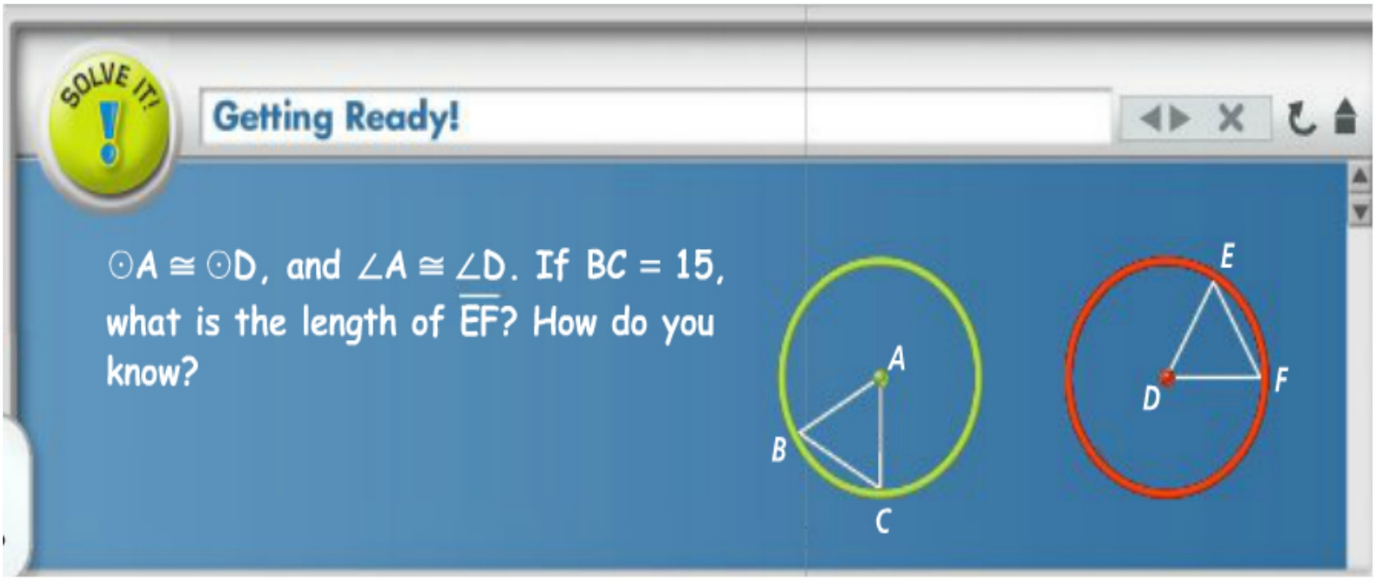


Obj: SWBAT use chords, secants and tangents in circles.

Obj: SWBAT use chords, secants and tangents in circles.

Agenda:
Warm up
Notes
practice
closure

Review - angles

Central angles = arc

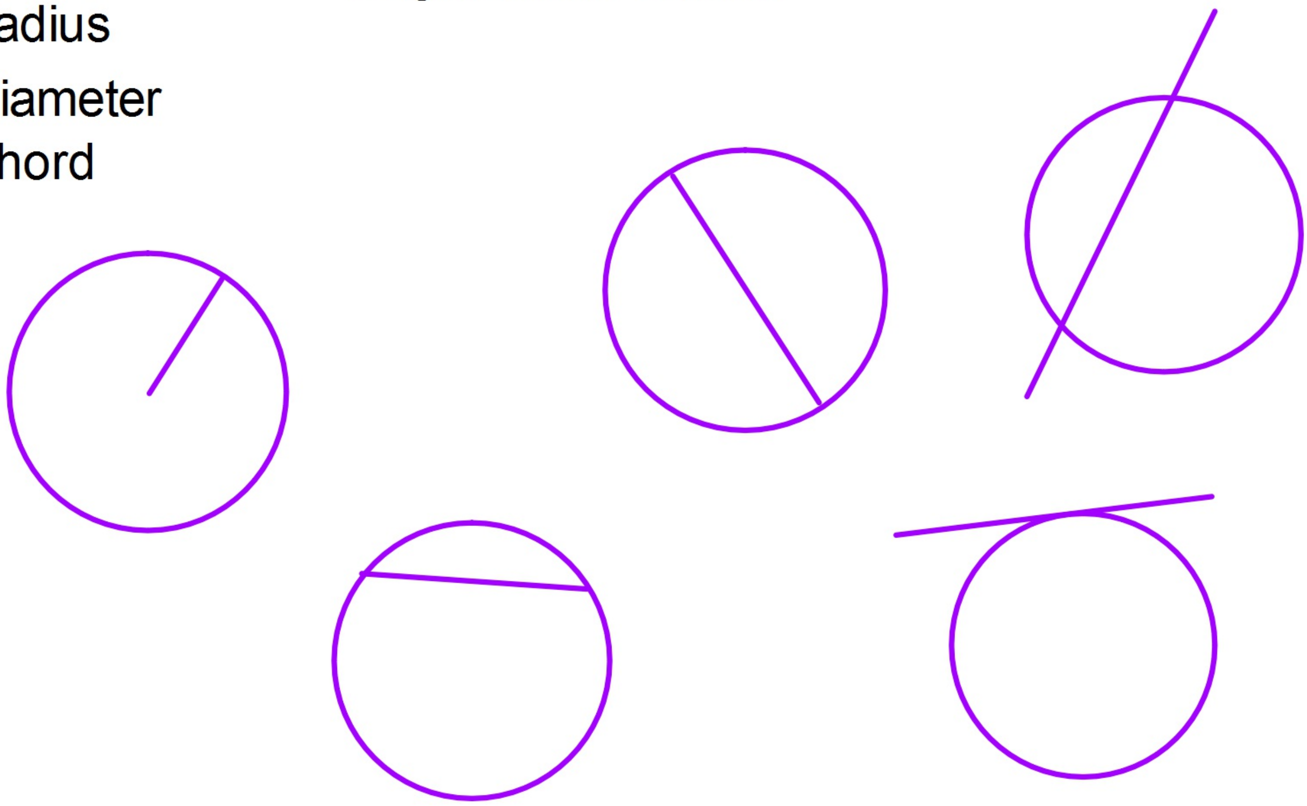
Inscribed angles = 1/2 arc

Interior angles = 1/2 (arc + arc)

Exterior angles = 1/2 (big arc - little arc)

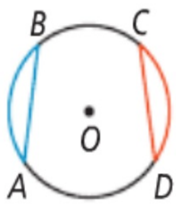
secant
tangent
radius
diameter
chord

Segments in Circles



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.

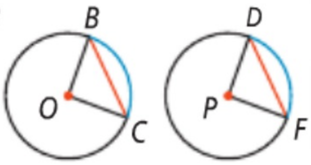


If $\overline{AB} \cong \overline{CD}$, then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

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

Problem 1 Using Congruent Chords

In the diagram, $\odot O \cong \odot P$. Given that $\overline{BC} \cong \overline{DF}$, what can you conclude?



$\angle O \cong \angle P$ because, within congruent circles, congruent chords have congruent central angles (conv. of Thm. 12-5). $\overset{\frown}{BC} \cong \overset{\frown}{DF}$ because, within congruent circles, congruent chords have congruent arcs (Thm. 12-6).

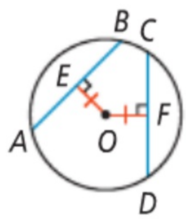
Got It? **1. Reasoning** Use the diagram in Problem 1. Suppose you are given $\odot O \cong \odot P$ and $\angle OBC \cong \angle PDF$. How can you show $\angle O \cong \angle P$? From this, what else can you conclude?

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).



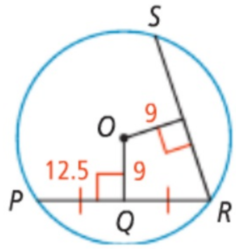
If $OE = OF$, then $\overline{AB} \cong \overline{CD}$.

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

Problem 2 Finding the Length of a Chord

GRIDDED RESPONSE

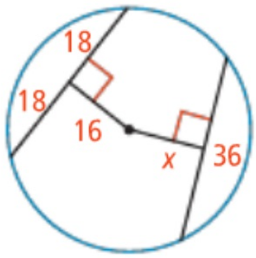
What is the length of $\overline{RS}$ in $\odot O$?



Know

The diagram indicates that $PQ = QR = 12.5$ and $\overline{PR}$ and $\overline{RS}$ are both 9 units from the center.

Got It? **2.** What is the value of x? Justify your answer.



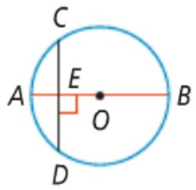
Theorem 12-8

Theorem

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

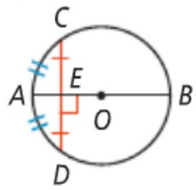
If . . .

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



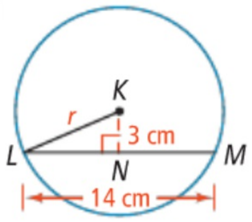
Then . . .

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



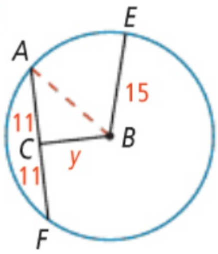
Algebra **What is the value of each variable to the nearest tenth?**

A



$LN = \frac{1}{2}(14) = 7$	A diameter $\perp$ to a chord bisects the chord.
$r^2 = 3^2 + 7^2$	Use the Pythagorean Theorem.
$r \approx 7.6$	Find the positive square root of each side.

B

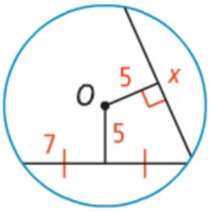


$\overline{BC} \perp \overline{AF}$	A diameter that bisects a chord that is not a diameter is $\perp$ to the chord.
$BA = BE = 15$	Draw an auxiliary $\overline{BA}$. The auxiliary $\overline{BA} \cong \overline{BE}$ because they are radii of the same circle.
$y^2 + 11^2 = 15^2$	Use the Pythagorean Theorem.
$y^2 = 104$	Solve for y^2.
$y \approx 10.2$	Find the positive square root of each side.

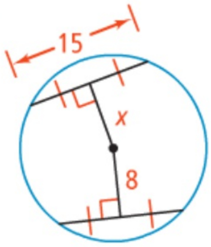
Find the value of *x*.

See Pı

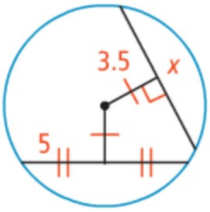
8.



9.

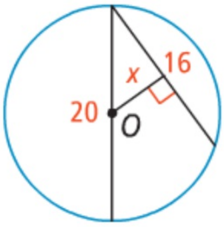


10.

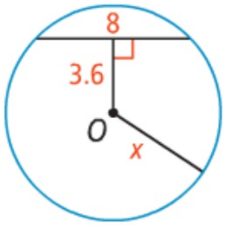


Algebra **Find the value of *x* to the nearest tenth.**

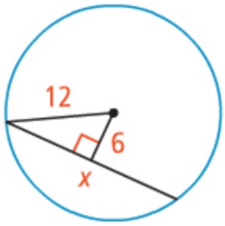
13.



14.



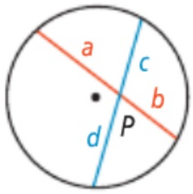
15.



Theorem 12-15

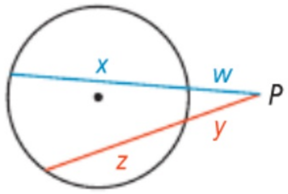
For a given point and circle, the product of the lengths of the two segments from the point to the circle is constant along any line through the point and circle.

I.



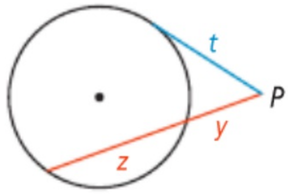
$a \cdot b = c \cdot d$

II.



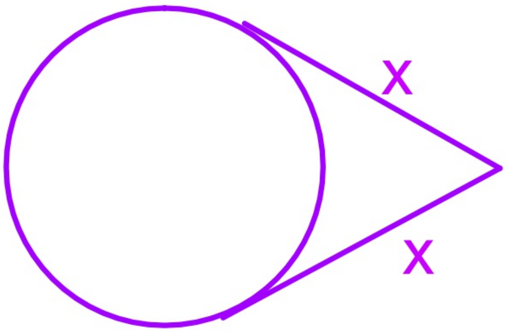
$(w + x)w = (y + z)y$

III.



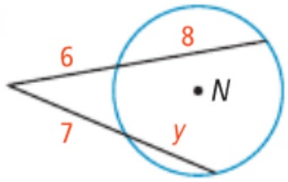
$(y + z)y = t^2$

Tangents to circles:

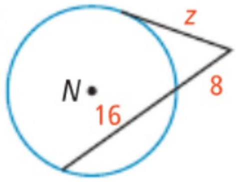


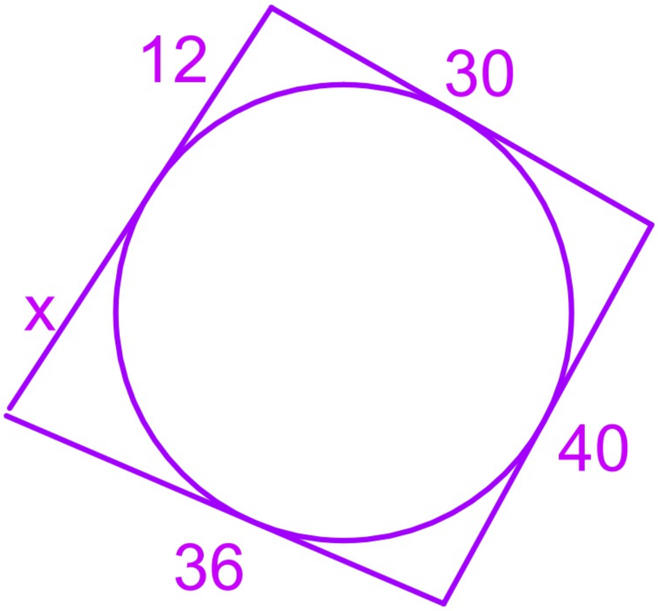
Algebra Find the value of the variable in $\odot N$.

A



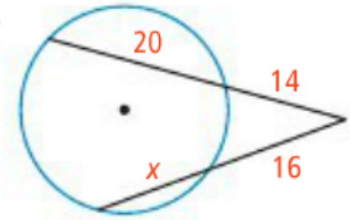
B



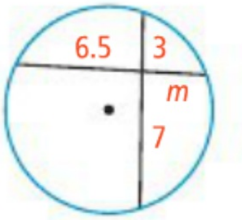


Got It? **3.** What is the value of the variable to the nearest tenth?

a.



b.



Closure:

How will you know which formula to use for the problems?

Practice problems: