



If two chords are congruent, then their corresponding arcs are congruent.

Solve for x.

$$8x - 7 = 3x + 3$$

$$5x = 10$$

$$x = 2$$

Example

Find WX.

$$y + 4 = 2y - 3$$

$$7 = y$$

$$2y - 3 = WX$$

$$2(7) - 3 =$$

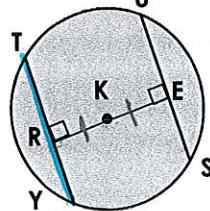
$$14 - 3 =$$

$$11 = WX$$

If the corresponding arcs \cong
then the two chords \cong

If two chords are congruent, then they are equidistant from the center.

In $\odot K$, K is the midpoint of RE. If $TY = -3x + 56$ and $US = 4x$, find the length of TY.



$$-3x + 56 = 4x$$

$$56 = 7x$$

$$8 = x$$

$$-3x + 56 = TY$$

$$-3(8) + 56 = TY$$

$$-24 + 56 = TY$$

$$32 = TY$$

If a diameter is perpendicular to a chord, then it also bisects the chord.

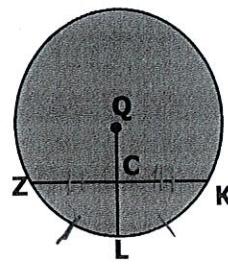
cut in half

This results in congruent arcs too.

Sometimes, this creates a right triangle & you'll use Pythagorean Theorem.

$$a^2 + b^2 = c^2$$

In $\odot Q$, $\widehat{KL} \cong \widehat{LZ}$. If $CK = 2x + 3$ and $CZ = 4x$, find x.



$$2x + 3 = 4x$$

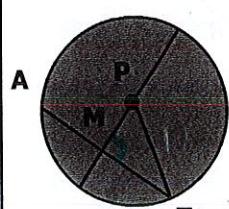
$$3 = 2x$$

$$\frac{3}{2} = x$$

$$1.5 = x$$

In $\odot P$, if $PM \perp AT$, $PT = 10$, and $PM = 8$, find AT .

$$AT = 12$$



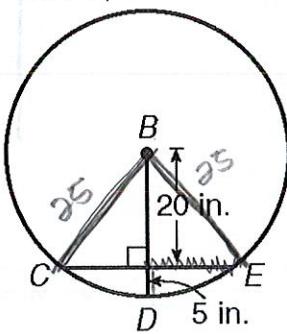
$$8^2 + b^2 = 10^2$$

$$64 + b^2 = 100$$

$$b^2 = 36$$

$$b = 6$$

Example



$$CE = 30$$

$$20^2 + b^2 = 25^2$$

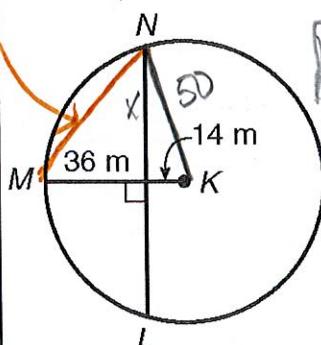
$$400 + b^2 = 625$$

$$b^2 = 225$$

$$b = 15$$

Chord Not
a radius

Example



$$LN = 96$$

$$x^2 + 14^2 = 50^2$$

$$x^2 + 196 = 2500$$

$$x^2 = 2304$$

$$x = 48$$

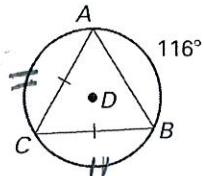
Name _____

Date _____

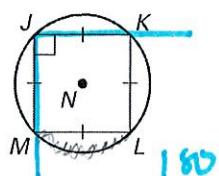
LESSON 10.3 Practice
For use with the lesson "Apply Properties of Chords"
Find the measure of the given arc or chord.

1. $m\widehat{BC} = 122$

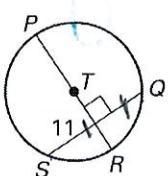
$$\begin{array}{r}
 360 \\
 -116 \\
 \hline
 244 \\
 \div 2 \\
 \hline
 122
 \end{array}$$



2. $m\widehat{LM} = 90$

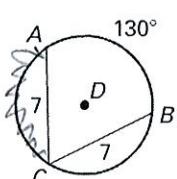


3. $\overline{OS} = 22$

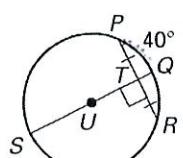


4. $m\widehat{AC} = 115$

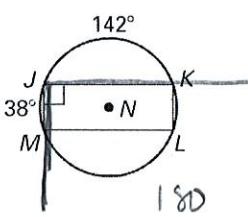
$$\begin{array}{r}
 360 \\
 -130 \\
 \hline
 230 \\
 \div 2 \\
 \hline
 115
 \end{array}$$



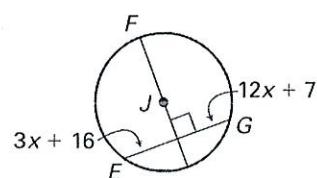
5. $m\widehat{PQR} = 80$



6. $m\widehat{KLM} = 180^\circ$

**Find the value of x .**

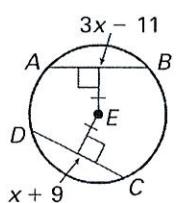
7.



$3x + 16 = 12x + 7$

$$\begin{array}{r}
 9 = 9x \\
 1 = x
 \end{array}$$

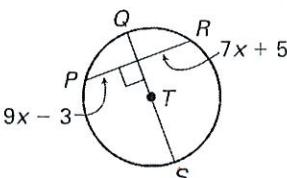
8.



$3x - 11 = x + 9$

$2x = 20 \quad [x = 10]$

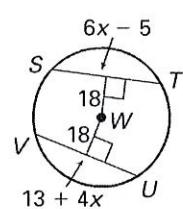
9.



$9x - 3 = 7x + 5$

$$\begin{array}{r}
 2x = 8 \\
 x = 4
 \end{array}$$

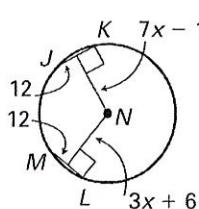
10.



$6x - 5 = 13 + 4x$

$$\begin{array}{r}
 2x = 18 \\
 x = 9
 \end{array}$$

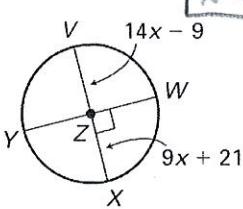
11.



$7x - 10 = 3x + 6$

$$\begin{array}{r}
 4x = 16 \\
 x = 4
 \end{array}$$

12.

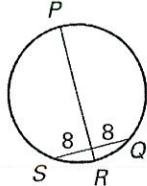
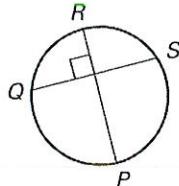
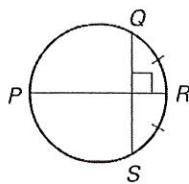
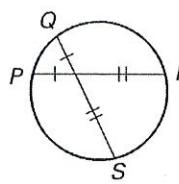


$14x - 9 = 9x + 21$

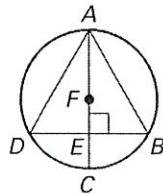
$$\begin{array}{r}
 5x = 30 \\
 x = 6
 \end{array}$$

Name _____

Date _____

**LESSON
10.3****Practice** *continued*
*For use with the lesson "Apply Properties of Chords"***In Exercises 13–16, determine whether \overline{PR} is a diameter of the circle.****13.**yes, chord
was bisected**14.**yes, perpendicular
to chord.**15.**Yes, perpend.
and chords
are congruent**16.**

NO.

17.~~Proof~~ Complete the proof.**GIVEN:** \overline{AC} is a diameter of $\odot F$. $\overline{AC} \perp \overline{BD}$ **PROVE:** $\widehat{AD} \cong \widehat{AB}$ **Statements**1. \overline{AC} is a diameter of $\odot F$. $\overline{AC} \perp \overline{BD}$ 2. ?3. $\overline{DE} \cong \overline{BE}$ 4. $\overline{AE} \cong \overline{CE}$ 5. $\triangle AED \cong \triangle AEB$ 6. ?7. $\widehat{AD} \cong \widehat{AB}$ **Reasons**1. ?

2. All right angles are congruent.

3. ?4. ?5. ?6. Corresponding parts of congruent triangles
are congruent.7. ?

