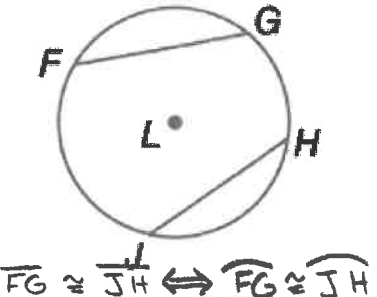


10.3 Arcs and Chords
Geometry CP

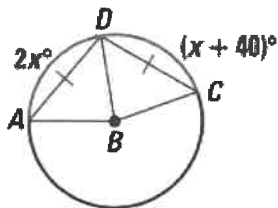
Recall: What is a chord of a circle?

a segment whose endpoints are on the circle



<p>Theorem 10.2</p>	<p>In the same circle, or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.</p>	
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1. Find the measure of \widehat{AD} .



$$\overline{AD} \cong \overline{DC}$$

$$\widehat{AD} \cong \widehat{DC}$$

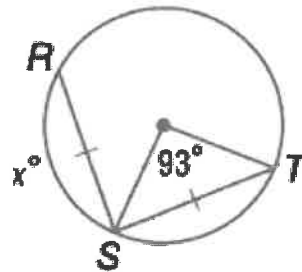
$$2x = x + 40$$

$$x = 40$$

$$m\widehat{AD} = 2(40)$$

$$= 80^\circ$$

3. Find the value of x

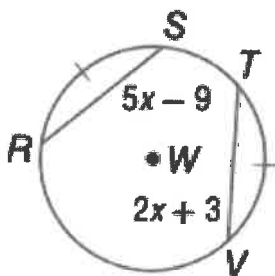


$$m\widehat{ST} = 93^\circ$$

$$\widehat{RS} \cong \widehat{ST}$$

$$m\widehat{RS} = 93^\circ$$

2. In $\odot W$, $\widehat{RS} \cong \widehat{TV}$. Find RS .



$$5x - 9 = 2x + 3$$

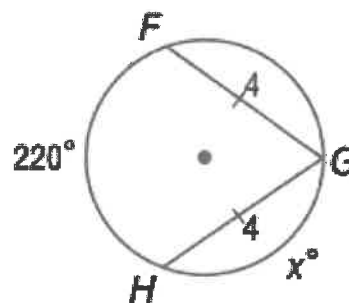
$$3x = 12$$

$$x = 4$$

$$RS = 5(4) - 9$$

$$RS = 11$$

4. Find the value of x



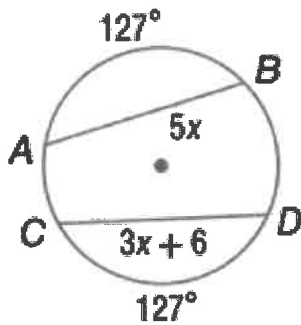
$$\widehat{FG} \cong \widehat{HG}$$

$$360 = 220 + x + x$$

$$140 = 2x$$

$$70^\circ = x$$

5. Find the value of x



$$5x = 3x + 6$$

$$2x = 6$$

$$x = 3$$

<p>Theorem 10.3</p>	<p>If a diameter of a circle is perpendicular to a chord, then the diameter bisects the chord and its arc</p>	
<p>Theorem 10.4</p>	<p>If one chord is a perpendicular bisector of another chord, then the first chord is a diameter.</p>	

6. In $\odot S$:

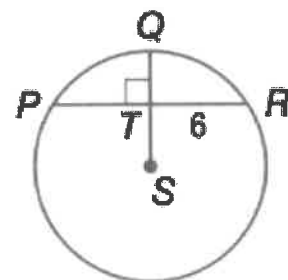
a. $m\widehat{PQR} = 98^\circ$. Find $m\widehat{PQ}$.

$\overline{SQ} \perp$ to \overline{PR} so by Thm 10.3
 $\overline{PT} \cong \overline{TR}$

$$m\widehat{PQ} = 49^\circ$$

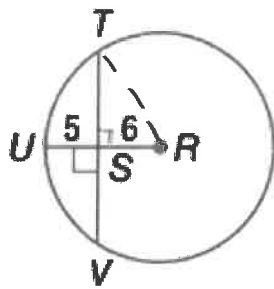
b. Find PR

$$PR = 12$$

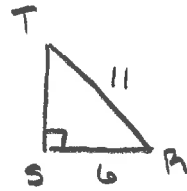


10.3 Arcs and Chords
Geometry CP

7. In $\odot R$, Find TV . Round to the nearest hundredth.



radius = $5 + 6 = 11$



$$6^2 + (TS)^2 = 11^2$$

$$36 + (TS)^2 = 121$$

$$(TS)^2 = 85$$

$$TS = \sqrt{85}$$

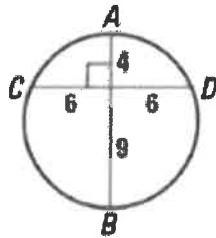
$$TS = SV$$

$$TV = TS + SV$$

$$TV = \sqrt{85} + \sqrt{85}$$

$$TV = 2\sqrt{85}$$

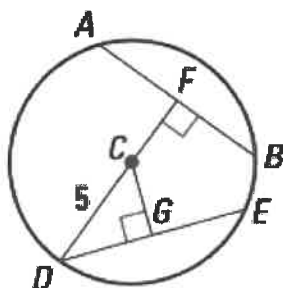
8. Determine whether \overline{AB} is a diameter of the circle.



\overline{AB} is a diameter of the circle b/c \overline{AB} is a perpendicular bisector to \overline{CD}

<p>Theorem 10.5</p>	<p>In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center.</p>	<p>$\overline{FG} \cong \overline{JH} \iff \overline{XL} \cong \overline{LY}$</p>
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9. $AB = 8$, $DE = 8$, and $CD = 5$. Find CF



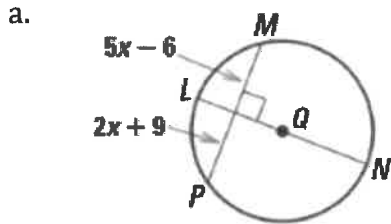
$$\overline{AB} \cong \overline{DE}$$

by Thm 10.5

$$\overline{CG} \cong \overline{CF}$$

10.3 Arcs and Chords
Geometry CP

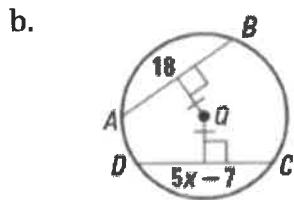
10. Find the value of x in $\odot Q$. Provide a theorem or postulate to justify your reasoning.



$$5x - 6 = 2x + 9$$

$$3x = 15$$

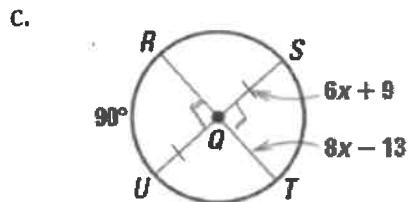
$$x = 5 \quad \text{Thm 10.3}$$



$$18 = 5x - 7$$

$$25 = 5x$$

$$5 = x \quad \text{Thm 10.5}$$



$$\overline{SQ} \cong \overline{QU} \quad \text{Thm 10.3}$$

$$\overline{QR} \cong \overline{QT} \quad \text{Thm 10.3}$$

all radii are congruent so

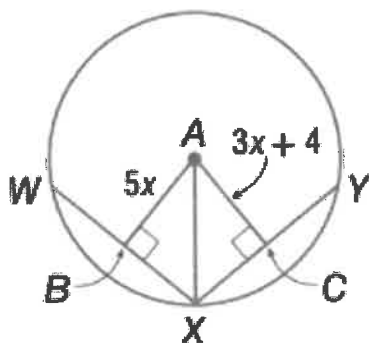
$$\overline{SQ} \cong \overline{QT}$$

$$6x + 9 = 8x - 13$$

$$22 = 2x$$

$$11 = x$$

10. In $\odot A$, $WX = XY = 22$. Find AB



$$5x = 3x + 4 \quad \text{Thm 10.5}$$

$$2x = 4$$

$$x = 2$$

$$AB = 5(2)$$

$$AB = 10$$

10.3 Arcs and Chords
Geometry CP

11. In $\odot P$, $JK = 10$ and $m\widehat{JLK} = 134$. Find each measure.

a. $m\widehat{JL}$

by Thm 10.3 $\overline{JQ} \cong \overline{KQ}$

$$m\widehat{JLK} = m\widehat{JL} + m\widehat{LQ}$$

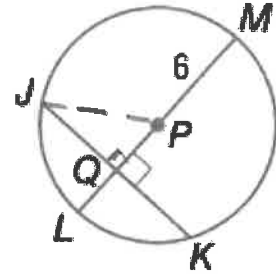
$$134 = x + x$$

$$134 = 2x$$

b. PQ

$$67 = x$$

$$m\widehat{JL} = 67^\circ$$



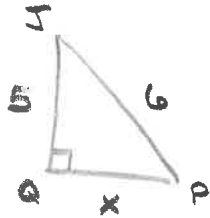
$PM = 6$ radius

JP also radius

$JK = 10$ Given

so equals 6

$JQ = 5$ Thm 10.3



$$5^2 + x^2 = 6^2$$

$$25 + x^2 = 36$$

$$x^2 = 11$$

$$x = \sqrt{11} = PQ$$

