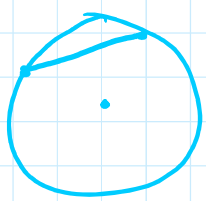
10.3 Using Chords

Tuesday, September 5, 2017 1:18 PM

What You Will Learn

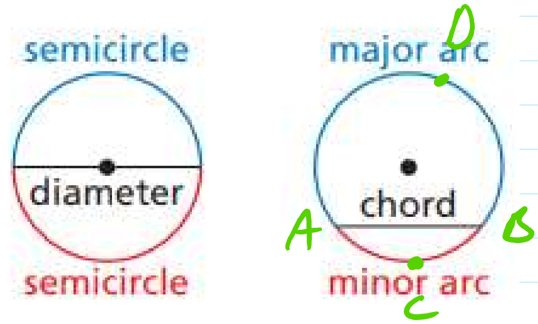
- Use chords of circles to find lengths and arc measures.

segment whose endpoints are on the circle.



Using Chords of Circles

Recall that a *chord* is a segment with endpoints on a circle. Because its endpoints lie on the circle, any chord divides the circle into two arcs. A diameter divides a circle into two semicircles. Any other chord divides a circle into a minor arc and a major arc.



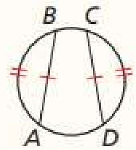
$\overset{\frown}{AB}$ - minor } same

$\overset{\frown}{ACB}$ - minor

$\overset{\frown}{ADB}$ - major

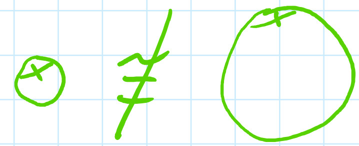
Theorem 10.6 Congruent Corresponding Chords Theorem

In the same circle, or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.



Proof Ex. 19, p. 550

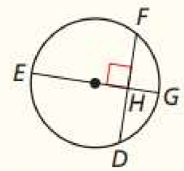
$\overset{\frown}{AB} \cong \overset{\frown}{CD}$ if and only if $\overline{AB} \cong \overline{CD}$.



chords are congruent, but arc lengths aren't!

Theorem 10.7 Perpendicular Chord Bisector Theorem

If a diameter of a circle is perpendicular to a chord, then the diameter bisects the chord and its arc.

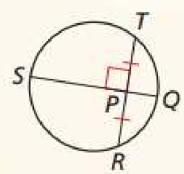


Proof Ex. 22, p. 550

If $\overline{EG}$ is a diameter and $\overline{EG} \perp \overline{DF}$, then $\overline{HD} \cong \overline{HF}$ and $\overset{\frown}{GD} \cong \overset{\frown}{GF}$.

Theorem 10.8 Perpendicular Chord Bisector Converse

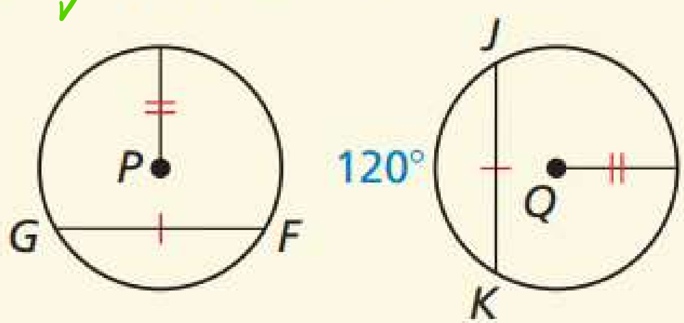
If one chord of a circle is a perpendicular bisector of another chord, then the first chord is a diameter.



Proof Ex. 23, p. 550

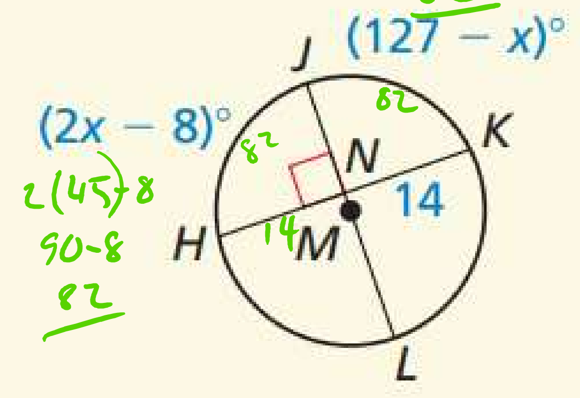
If $\overline{QS}$ is a perpendicular bisector of $\overline{TR}$, then $\overline{QS}$ is a diameter of the circle.

In the diagram, $\odot P \cong \odot Q$, $\overline{FG} \cong \overline{JK}$, and $m\overset{\frown}{JK} = 120°$. Find $m\overset{\frown}{FG}$.



$m\overset{\frown}{FG} = 120°$

127 − (45)
82



2(45) − 8
90 − 8
82

a. Find *KH*.

KH = 28

b. Find $m\widehat{HLK}$.

$m\widehat{HLK} = 196°$

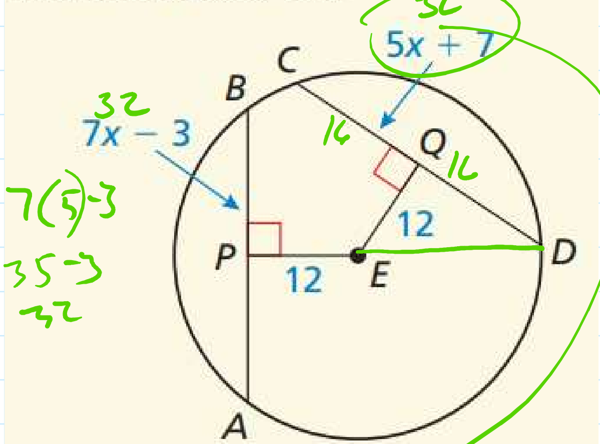
2x − 8 = 127 − x

3x/3 = 135/3

x = 45

360
− 164
196

In the diagram, *EP* = *EQ* = 12, *CD* = 5*x* + 7, and *AB* = 7*x* − 3. Find the radius of ⊙*E*.



7(5) − 3
35 − 3
32

5(5) + 7

7x − 3 = 5x + 7

2x = 10

x = 5

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

$12^2 + 16^2 = r^2$

$144 + 256 = r^2$

$\sqrt{400} = \sqrt{r^2}$

20 = r

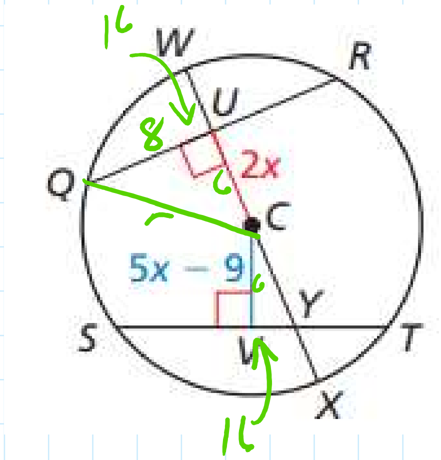
radius = 20

$5(5)+7$

$25+7$

32

In the diagram, $QR = ST = 16$, $CU = 2x$, and $CV = 5x - 9$. Find the radius of $\odot C$.



$2x = 5x - 9$

$9 = 3x$

$3 = x$

radius = 10

$8^2 + 6^2 = c^2$

$8^2 + 6^2 = r^2$

$64 + 36 = r^2$

$\sqrt{100} = \sqrt{r^2}$

$10 = r$

Practice *sec 10.3* **pg.**

549: 3-11A, 15,

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