Name _____ Date _____

10.3 Using Chords

For use with Exploration 10.3

Essential Question What are two ways to determine when a chord is a diameter of a circle?

1 EXPLORATION: Drawing Diameters

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Use dynamic geometry software to construct a circle of radius 5 with center at the origin. Draw a diameter that has the given point as an endpoint. Explain how you know that the chord you drew is a diameter.

a. $(4, 3)$

b. $(0, 5)$

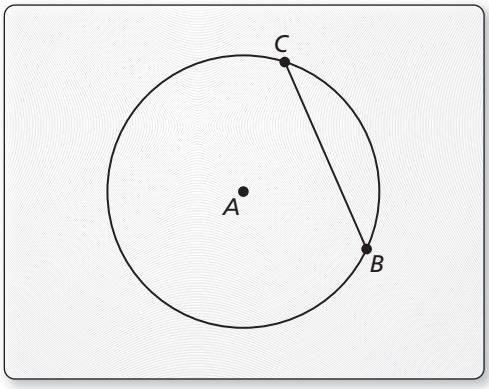
c. $(-3, 4)$

d. $(-5, 0)$

2 EXPLORATION: Writing a Conjecture about Chords

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Use dynamic geometry software to construct a chord $\overline{BC}$ of a circle A. Construct a chord on the perpendicular bisector of $\overline{BC}$. What do you notice? Change the original chord and the circle several times. Are your results always the same? Use your results to write a conjecture.

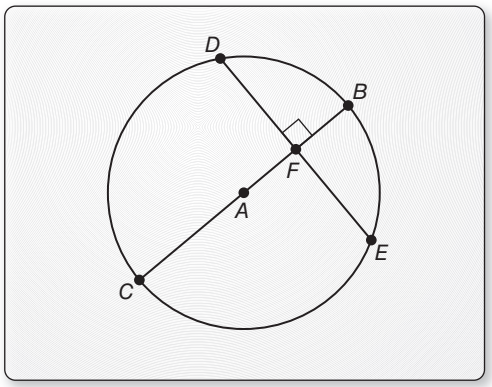


10.3 Using Chords (continued)

3 EXPLORATION: A Chord Perpendicular to a Diameter

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Use dynamic geometry software to construct a diameter $\overline{BC}$ of a circle A. Then construct a chord $\overline{DE}$ perpendicular to $\overline{BC}$ at point F. Find the lengths DF and EF. What do you notice? Change the chord perpendicular to $\overline{BC}$ and the circle several times. Do you always get the same results? Write a conjecture about a chord that is perpendicular to a diameter of a circle.



Communicate Your Answer

4. What are two ways to determine when a chord is a diameter of a circle?

Name _____ Date _____

10.3 Notetaking with Vocabulary

For use after Lesson 10.3

In your own words, write the meaning of each vocabulary term.

chord

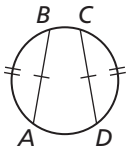
arc

diameter

Theorems

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.



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

Notes:

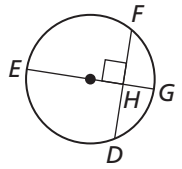
Name_____ Date _____

10.3 Notetaking with Vocabulary (continued)

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.

Notes:

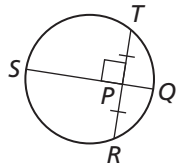


If $\overline{EG}$ is a diameter and $\overline{EG} \perp \overline{DF}$, then $\overline{HD} \cong \overline{HF}$ and $\overset{\frown}{GD} \cong \overset{\frown}{GF}$.

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.

Notes:

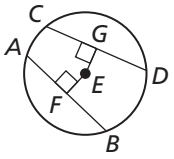


If $\overline{QS}$ is a perpendicular bisector of $\overline{TR}$, then $\overline{QS}$ is a diameter of the circle.

Theorem 10.9 Equidistant Chords Theorem

In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center.

Notes:



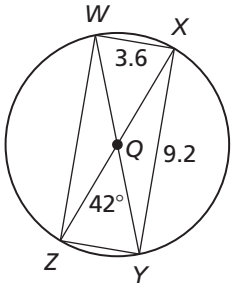
$\overline{AB} \cong \overline{CD}$ if and only if $EF = EG$.

Name _____ Date _____

10.3 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–4, find the measure of the arc or chord in $\odot Q$.



1. $m\overset{\frown}{WX}$

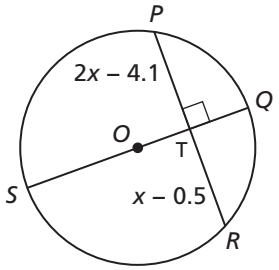
2. YZ

3. WZ

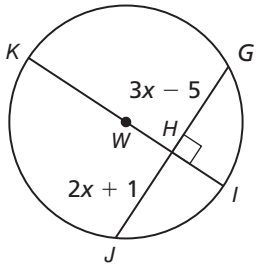
4. $m\overset{\frown}{XY}$

In Exercises 5 and 6, find the value of x.

5.

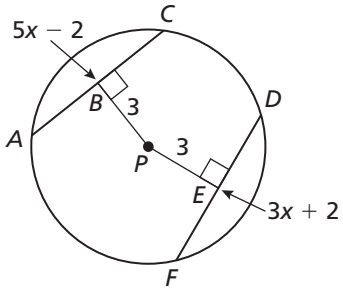


6.



In Exercises 7 and 8, find the radius of the circle.

7.



8.