Math 3 8.7 Chords & Arcs of Circles Unit 8

*SWBAT solve for unknown variables using theorems about chords and arcs of circles.*

The given point is called the \_\_\_\_\_\_\_\_\_\_\_\_\_.

This point names the circle.

Any segment with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are the center and a point on the circle is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



Any segment with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are on a circle is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A \_\_\_\_\_\_\_\_\_\_\_\_\_ that passes through the center is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a circle.

**Example 1:** Name the circle, a radius, a chord, and a diameter of the circle.



Circle: \_\_\_\_\_\_\_\_\_\_\_ Circle: \_\_\_\_\_\_\_\_\_\_\_

Radius: \_\_\_\_\_\_\_\_\_\_\_ Radius: \_\_\_\_\_\_\_\_\_\_\_

Chord: \_\_\_\_\_\_\_\_\_\_\_\_ Chord: \_\_\_\_\_\_\_\_\_\_\_\_

Diameter: \_\_\_\_\_\_\_\_\_\_ Diameter: \_\_\_\_\_\_\_\_\_\_

Since a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is composed of two radii, then **d = 2r** and **r = d/2**

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| **Theorem 1:** | **Converse Theorem 1:** |  |
| Within a circle or in congruent circles, chords equidistant from the center or centers are congruent. | Within a circle or in congruent circles, congruent chords are equidistant from the center (or centers). |
| **Theorem 2:** | **Converse Theorem 2:** |  |
| Within a circle or in congruent circles, congruent central angles have congruent arcs. | Within a circle or in congruent circles, congruent arcs have congruent central angles. |
| **Theorem 3:** | **Converse Theorem 3:** |  |
| Within a circle or in congruent circles, congruent central angles have congruent chords. | Within a circle or in congruent circles, congruent chords have congruent central angles. |
| **Theorem 4:** | **Converse Theorem 4:** |  |
| Within a circle or in congruent circles, congruent chords have congruent arcs. | Within a circle or in congruent circles, congruent arcs have congruent chords. |

**Example 2:** The following chords are equidistant from the center of the circle.

a) What is the length of RS?

****b) Solve for x.

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| **Theorem 5:** |  |
| In a circle, if a diameter is perpendicular to a chord, then it bisects the chord and its arc. |
| **Theorem 6:** |  |
| In a circle, if a diameter bisects a chord that is not a diameter, then it is perpendicular to the chord. |
| **Theorem 7:** |  |
| In a circle, the perpendicular bisector of a chord contains the center of the circle. |

**Example 3:** In $⊙$O, $\overbar{CD}⊥\overbar{OE}, OD=15, and CD=24. $Find x.

**Example 4:** Find the value of x to the nearest tenth.

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**You Try!** Find the value of x to the nearest tenth.

1.
2.