Complete the outline as you view Video Lecture 12.2. Pause the video as needed to fill in the blanks. Then press Play to continue. Also, circle your answer to each numbered exercise.

**Objective 1** \hspace{1cm} Use Congruent Chords, Arcs, and Central Angles

1. A(n) ________ is a segment whose endpoints are on the circle.

2. A(n) ________ is a special chord (that passes through the center of the circle.)

### Congruent Central Angles and Arcs

**Theorem**

Within a circle or in congruent circles, congruent central angles have congruent arcs.

**Converse**

If $\angle AOB \equiv \angle COD$, then $\overline{AB} \equiv \overline{CD}$.

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### Congruent Central Angles and Chords

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Congruent Chords and Arcs

**Theorem**
Within a circle or in congruent circles, congruent chords have congruent arcs.

**Converse**
Within a circle or in congruent circles, congruent arcs have congruent chords.

---

Work Video Exercises 1–3 with me.

In \( \odot O \), \( \overline{CD} = 50^\circ \) and \( \overline{CA} \equiv \overline{BD} \). Also, the center of the circle, point \( O \), is the intersection of \( \overline{CB} \) and \( \overline{AD} \).

1. Find \( m\angle 1 \).

2. Find \( m\angle 2 \).

3. What is \( m\overline{AB} \)?

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Chords Equidistant from the Center Are Congruent

**Theorem**
Within a circle or in congruent circles, chords equidistant from the center or centers are congruent.

**Converse**
Within a circle or in congruent circles, congruent chords are equidistant from the center (or centers).
**Objective 2** Use Perpendicular Bisectors to Chords

<table>
<thead>
<tr>
<th>Theorem</th>
<th>If...</th>
<th>Then...</th>
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</thead>
<tbody>
<tr>
<td><strong>Objective 2</strong> Use Perpendicular Bisectors to Chords</td>
<td><strong>Theorem</strong> In a circle, if a diameter is perpendicular to a chord, then it bisects the chord and its arc.</td>
<td><strong>Theorem</strong> If... Then... In a circle, if a diameter is ( AB ) and ( \overline{AB} \perp \overline{CD} ).</td>
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<td><strong>Theorem</strong> If... Then... In a circle, the perpendicular bisector of a chord contains the center of ( \odot O ).</td>
</tr>
</tbody>
</table>
Work Video Exercise 5 with me.

5. Find the value of $x$ to the nearest tenth.

Pause and work Video Exercise 6.

6. Find the value of $x$.

Play and check.

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