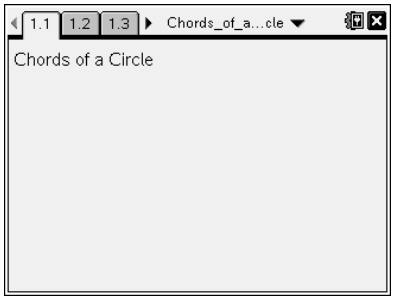
Chords of a Circle
Student Activity

Name _____

Class _____

Open or create the TI-Nspire document ***Chords_of_a_Circle.tns.***

Students will explore the relationship between chords of a circle and their perpendicular bisectors. It is strongly suggested that the student create the document if possible.



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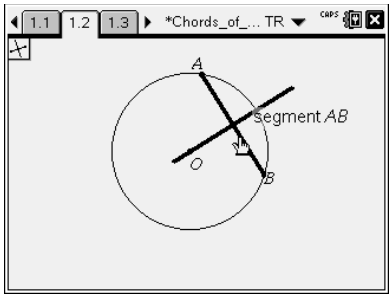
Press ctrl ▶ and ctrl ◀ to navigate through the lesson.

$\overline{AB}$ is a chord of circle O because its endpoints lie on the circle. Construct the perpendicular bisector of $\overline{AB}$ by pressing **Menu > Construction > Perpendicular Bisector**. Click $\overline{AB}$ and press esc to exit.



1. Drag point A or B. What do you observe about the perpendicular bisector of $\overline{AB}$?

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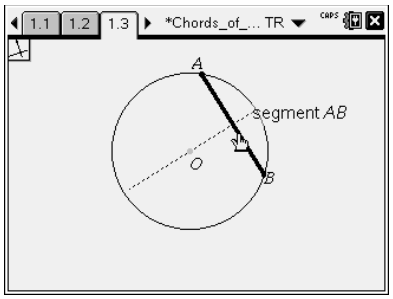
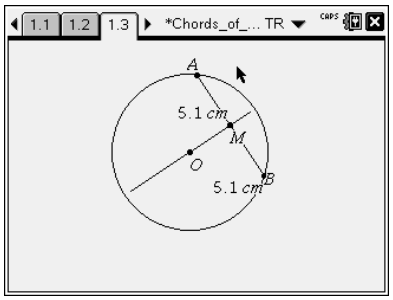
Construct a line through point O that is perpendicular to $\overline{AB}$. Press **Menu > Construction > Perpendicular**. Click point O, and then click $\overline{AB}$.



- Plot the intersection point of $\overline{AB}$ and the perpendicular line. Press **Menu > Points & Lines > Intersection Point(s)**. Click $\overline{AB}$ and the line perpendicular to $\overline{AB}$. Label this point M by immediately pressing shift M. Press esc to exit.



- Measure the lengths of $\overline{AM}$ and $\overline{MB}$. Press **Menu > Measurement > Length**. Click point A, click point M, move the measurement to the inside of the circle close to the middle of $\overline{AM}$, and press ⬚. Then click point M, click point B, move the measurement to the inside of the circle close to the middle of $\overline{MB}$, and press ⬚. Then press esc to exit.

2. Drag point *A* or *B*. What is the relationship between $\overline{AM}$ and $\overline{MB}$?

3. When the length of $\overline{AB}$ is as short as possible, what do you observe about $\overline{OM}$?

4. When the length of $\overline{AB}$ is as long as possible, what do you observe?

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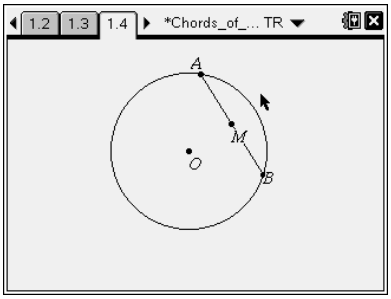

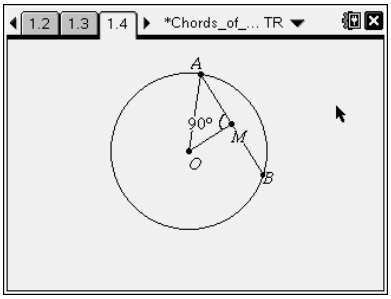

Construct the midpoint of $\overline{AB}$. Press **Menu > Construction > Midpoint**. Click $\overline{AB}$, and label this point *M* by immediately pressing shift M. Press esc to exit.

- Create $\overline{OM}$ by pressing **Menu > Points & Lines > Segment**. Click point *O*, and then click point *M*. Press esc to exit.
- Measure $\angle AMO$ by pressing **Menu > Measurement > Angle**. Click point *A*, then click point *M*, and then click point *O*. Press esc to exit. **Note:** you may need to grab and move either the letter *M* or the 90^{o}.
- Create radius $\overline{AO}$ by pressing **Menu > Points & Lines > Segment**. Click point *A*, and then click point *O*. Press esc to exit.

5. What type of triangle is ΔAMO?

6. When given the lengths of any 2 sides of ΔAMO, what equation can be used to find the length of the third side?

7. If $AB = 6$ and $AO = 5$, find the length of $\overline{OM}$.

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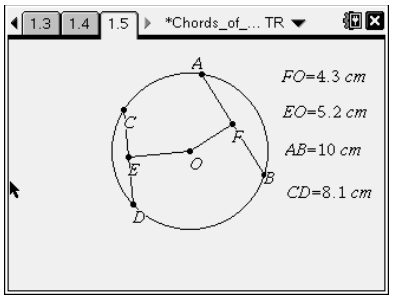
Drag points *A*, *B*, and *C* until $\overline{FO} \cong \overline{EO}$.



8. What is the relationship between $\overline{AB}$ and $\overline{CD}$?

9. Drag points *A*, *B*, *C*, and *D* until $\overline{AB} \cong \overline{CD}$. What is the relationship between $\overline{FO}$ and $\overline{EO}$?