LESSON 10.2

NAME _____ DATE _____

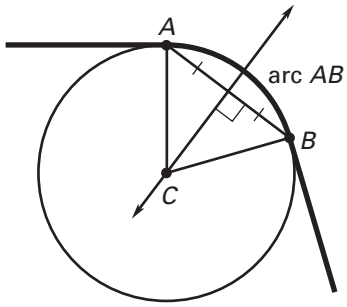
Available as a transparency

Application Lesson Opener

For use with pages 603–611

You will need: • graph paper • ruler • compass • protractor

An engineer designs a curve in a road that is an arc of a circle as follows: Given two points A and B, the engineer locates a point C on the perpendicular bisector of $\overline{AB}$, then draws a circle with center C and radius AC. The portion of the circle from A to B is an arc that represents the curved road between A and B.



1. Why does the engineer look for a point on the perpendicular bisector of $\overline{AB}$?

2. Graph the points $A(2, 2)$ and $B(14, 6)$ on a coordinate plane. Use the engineer's method to design a curved road between A and B. (You will need a compass.) Label the coordinates of point C. Find the length of the radius of $\odot C$. Find the measure of $\angle ACB$. How many choices are there for the location of C? Explain.

3. On the same graph, label M as the midpoint of $\overline{AB}$. Draw a circle with center M and radius AM. Do you think this circle gives a suitable arc for a curved road between A and B? Explain.

4. Draw several other arcs between A and B. As the radius of the circle drawn gets longer, what happens to the length of the arc between A and B? What happens to the measure of $\angle ACB$?