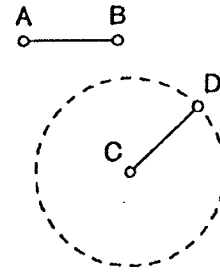


Duplicating a Line Segment

Name(s): _____

This method for duplicating a line segment with Sketchpad is equivalent to the standard compass-and-straightedge construction. However, Sketchpad's compass (the **Compass** tool) is collapsible, like Euclid's compass, meaning that after you make a circle you can't just pick up the tool, move it somewhere else, and make another circle the same size. As soon as you pick up Euclid's compass (or release the mouse button when you're using Sketchpad's **Compass** tool), you lose your compass setting. Duplicating a segment using only Sketchpad's freehand tools (or Euclid's tools) is more complicated than you'd expect. We'll get around this by using the **Construct** menu. This construction is the basis for many more complex constructions.

1. Construct \overline{AB} . This is your given segment.
2. Construct point C . This is one endpoint of your new segment.
3. Select \overline{AB} and point C ; then, in the **Construct** menu, choose **Circle By Center+Radius**.



If you start or finish drawing your segment with the tip of the **Segment** tool directly over an object, the object will highlight and Sketchpad will construct an endpoint on that object.

4. Construct \overline{CD} , where point D is on the circle.
 5. Hide the circle.
 6. Measure AB and CD .
- Q1** Drag points C and D . Describe the way each behaves.

Q2 Drag point A or point B . What effect does changing the length of \overline{AB} have on \overline{CD} ?

Q3 Write a paragraph describing why this construction works and comparing it to the way you would duplicate a segment using a compass and straightedge. In your paragraph, explain why it is necessary to use the command **Circle By Center+Radius** instead of using Sketchpad's **Compass** tool. (In other words, explain what you can do with an actual compass that you can't do with Sketchpad's compass.) Use a separate sheet, if necessary.