

Constructions and Copying a Line Segment

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CONCEPT

1

Constructions and Copying a Line Segment

Learning Objectives

- Define geometric construction
- Copy a given line segment using only a compass and a straightedge

Introduction to Constructions: Compass and Straightedge

The word **construction** in geometry has a very specific meaning: the drawing of geometric items such as lines and circles using only a **compass** and **straightedge**. A **compass** is a drawing tool that can be used to measure distances and draw arcs and circles. An **arc** is a piece of a circle.

We make **constructions** in geometry using a **compass** and a _____.

Compasses come in different forms. These are some examples and drawings of compasses. You can also see an arc in the last two pictures:

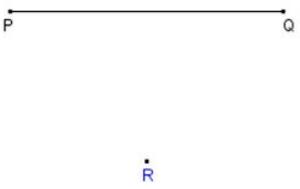
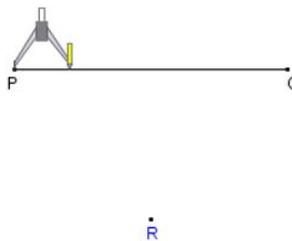
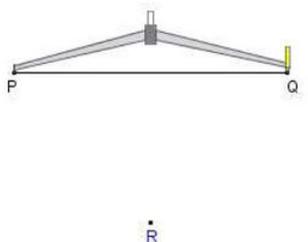
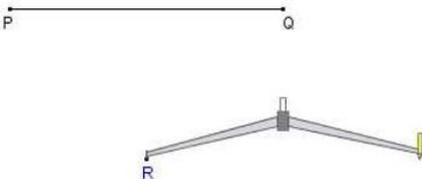


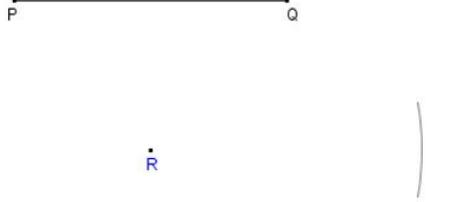
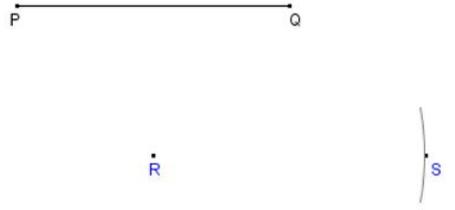
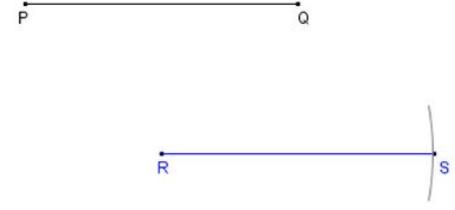
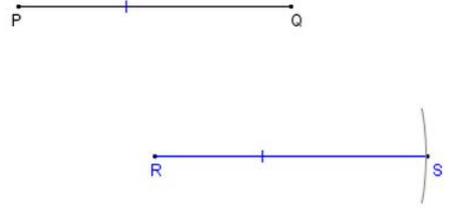
A **straightedge** can be anything with straight edge, like an index card. The important thing to remember with constructions is that you are *not* allowed to measure angles with a protractor or measure lengths with a ruler.



Construction: How to Copy a Line Segment

<http://www.mathopenref.com/constcopysegment.html>

| | After doing this | Your work should look like this |
|--------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| | Start with a line segment PQ that we will copy. |  |
| Step 1 | Mark a point R that will be one endpoint of the new line segment. |  |
| Step 2 | Set the compass point on the point P of the line segment to be copied. |  |
| Step 3 | Adjust the compass width to the point Q. The compass width is now equal to the length of the line segment PQ. |  |
| Step 4 | Without changing the compass width, place the compass point on the the point R on the line you drew in step 1 |  |

| | | |
|--------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Step 5 | Without changing the compass width, Draw an arc roughly where the other endpoint will be. |  |
| Step 6 | Pick a point S on the arc that will be the other endpoint of the new line segment. |  |
| Step 7 | Draw a line from R to S. |  |
| Step 8 | Done. The line segment RS is equal in length (congruent to) the line segment PQ. |  |

Reading Check:

1. *Fill in the blank:* A construction is a geometric drawing made with only a _____ and a _____.
2. *Copy the line segment seen below using the steps you learned to make a construction. If you don't have the tools to do it, write the steps you would take to copy it.*

