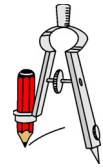


# Basic Geometric Constructions

Geometric constructions are drawings done using only these two tools:

- a compass
- a straightedge (a ruler).



A compass allows you to draw **points that are at a specified distance from a certain point** (a circle's center point). This fact proves out to be very useful in geometric drawings!

A **straightedge** is a ruler without measurement units (such as cm or in). It is used only to draw straight lines. You can use your normal ruler. Just ignore the units of measurement on it.

You will complete most of the exercises of this lesson using only a compass and a straightedge or drawing software. All you need is the ability to draw circles from their center point and to draw straight lines, so even the drawing tools in a word processor program are sufficient.

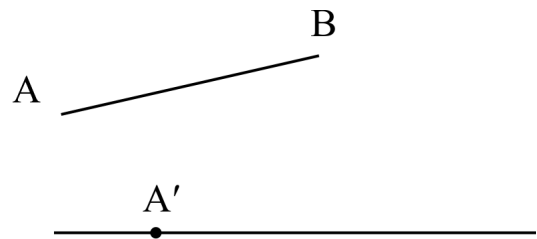
Tips: 1. In MS Word, go to View → Toolbars → Drawing to see the drawing tools.

2. In many programs, holding the Control and Shift keys while drawing a circle forces the circle to be drawn as a perfect circle (not as an ellipse) and from its center point (not from the side).

## Copy a Line Segment

Our task is to draw a copy of a given line segment, or in other words to draw another line segment of the same length, anywhere on the paper.

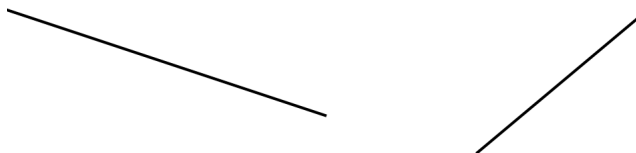
Start out by drawing a long line and drawing a point on it ( $A'$ ). Now, think: how can you use the compass to find where the point  $B'$  should be so that  $\overline{A'B'}$  is as long as  $\overline{AB}$ ?



1. Copy the line segment.



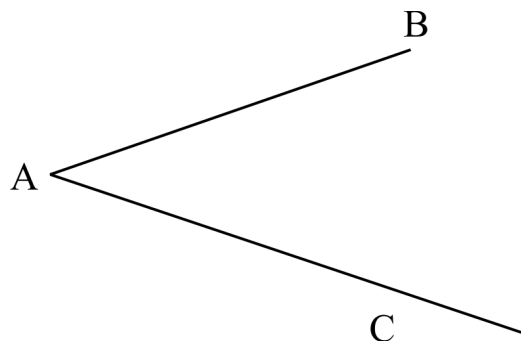
2. Draw a line segment that is as long as these two line segments together.



### An Isosceles Triangle

This is an easy construction, too.

Locate point C so that ABC will form an isosceles triangle. In other words,  $\overline{AB}$  and  $\overline{AC}$  need to be congruent.



3. Draw any isosceles triangle on blank paper. Also draw one with drawing software.

*Hint: Start out by drawing any angle.*

4. Draw an isosceles triangle with two sides this long: \_\_\_\_\_