

## Constructing Triangles

Your teacher will explain how to use the compass tool. Make sure you understand how it works by doing the following:

1. Launch Cabri. Draw a line segment, and label it “a”. Draw a point P not on the line segment. Construct a circle centered at P with length a as its radius.
2. How do you move the circle? Why?
3. How do you change the circle’s size? Why?
4. Delete the point. What happens to the circle? Why?
5. Draw a ray. Use the compass tool to construct a segment that starts at the ray’s origin, and has length a. Hide the circle and the ray.
6. How do you change the length of the new segment? Why?

Close the window. You do not have to save it, but you can.

### Triangles from Sides

7. Download the file **Making Triangles.fig**. Play around with the segments and angles to get a sense of what can and cannot be dragged.
8. Make a horizontal line or ray, using the parallel line tool. Use the compass tool to copy segment a onto it. Hide the line or ray.
9. Use the compass tool to construct a triangle with sides a, b, c. Label them as you go. Save the construction!
10. Drag a so it is 3 cm, and b so it is 5 cm. What values of b make the triangle
  - a. isosceles?
  - b. equilateral?
  - c. right?
  - d. disappear? (careful: there’s more than one answer here)

If a, b, c are given, notice that if it exists, the triangle you constructed is *rigid*: it has a given shape and size that cannot be changed.

Save your work under the name SSS.

## More Triangles

Once again, download the file **Making Triangles.fig**. You will make a bunch of constructions, each time saving them under a new name, and re-opening this file to do the next problem.

Construct triangles satisfying these constraints. (Hint: You can copy angles by using the parallel line tool.)

1. SSS (Use the compass tool. No need to re-do this if you saved it last time.)
2. SAS
3. ASA
4. AAS
5. AA: Construct two *non-congruent* triangles that satisfy AA.
6. SSA: Construct two *non-congruent* triangles that satisfy SSA. (Hint: start by copying the angle.)