# Geometer's Sketchpad – Part 3

Creating Formulas

In Part 3 you will learn how to create formulas involving measurements taken by Geometer's Sketchpad.

- Start a new sketch.

- Construct two non-intersecting line segments. Measure the lengths of both lines.

Your sketch should show mAB and mAC in the upper corner. We want to also display the sum of the two lengths.

- Choose Calculate from the Measure menu. This will open up a calculator like the one below.
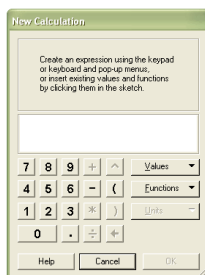
- On your sketch, select the mAB measurement. This should cause (mAB) to appear on the calculator's screen

- Now, click the addition sign on the calculator (because we want the sum of the lengths).

- Then, back on the sketch, select the mCD measurement. Now click OK. You should have the sum of the lengths now showing on your sketch as a new measurement.

Creating Sliders

Sliders are convenient ways to change measurements by just sliding a single point along a scale to get different values.

- Start a new sketch.

- Construct a horizontal line segment with endpoints A and B.   Make the line width thick.

- Place a third point C anywhere on the line.

- Select the points A, B, and C in order.

- From the Measure menu select Ratio and the measurement for the ratio $\dfrac{AC}{AB}$ appears.

- Slide the point C back and forth along the line and observe the values of the measured ratio. Notice that you have now created a slider that goes from 0 to 1.


Suppose we want a slider that goes from 0 to 10 instead.

- Open up the calculator (by choosing Calculate from the Measure menu). Create a formula that takes the ratio $\dfrac{AC}{AB}$ and multiplies it by 10. You should now have a second measurement that goes from 0 to 10 as the point C slides back and forth.

Changing Labels

Even though we have a nice slider, it doesn't look very much like a usable slider at this point. We can make it look nicer by hiding the labels on the endpoints.

- Select only the points A and B. Choose Hide Labels from the Display menu.

- That's better, but suppose our slider is supposed to measure something, like volume. The label "C" isn't very helpful. Let's change it.

- Double-click on the *label* C and the following window will appear:
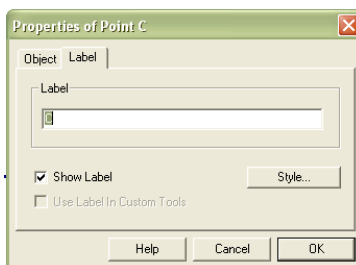
- Change the label to Volume.

If you don't like where the new label appears, you can drag it around (in a limited area) until it is where you want it. You will also see that the ratio AC/AB is changed to AVolume/AB, since the point C is now called Volume.

- Select the text tool [A] and double-click on the measurement that is the ratio AVolume/AB *10. This will bring up a window that looks similar to the one above. Type "The volume" in the label box and click OK. Now, move this measurement and text so that it is located just above the slider as in the figure below.
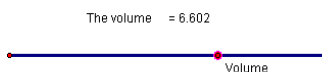
Exercises [Start a new sketch and type your name.]

1. Draw a triangle. Create a measurement that gives you the perimeter of the triangle. Change the text of this measurement so that it reads The perimeter of the triangle ABC = xx in. [The xx is the value of the perimeter for your sketch.]

2. Create a slider called Temperature that goes from 60 to 100. (Note: You will have to use a little bit of math to figure out how to do this. If it helps, make the slider go from 0 to 40 first and then figure out how to get it to go from 60 to 100).