


Name _____

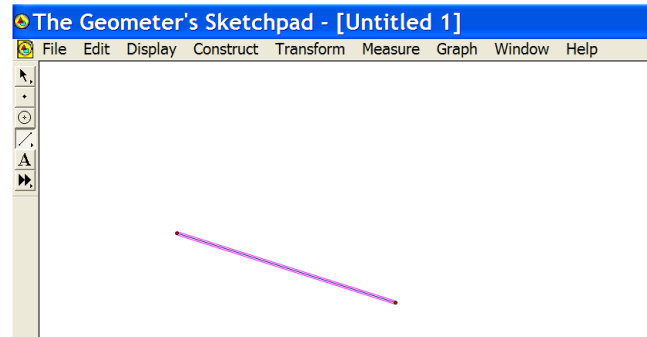
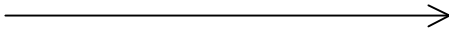
Date _____

We are going to investigate what happens when we draw the three angle bisectors of a triangle using Geometer's Sketchpad.

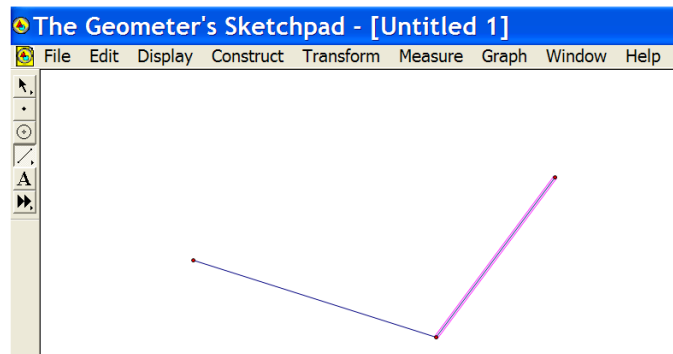
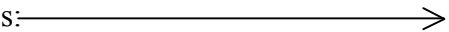
First, open up Geometer's Sketchpad, and open up a new sketch.

In order to draw three bisectors of a triangle, we need to first draw a triangle:

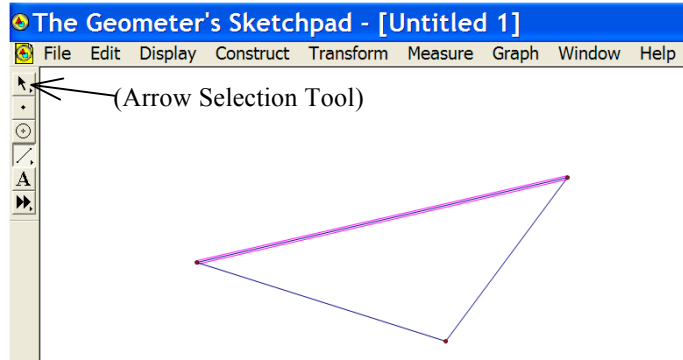
Click on the line segment tool  in the tool bar on the left side of the screen. Click anywhere in the white space and drag the pointer, stretching the line segment. Click to end the segment. Your sketch should look similar to this:




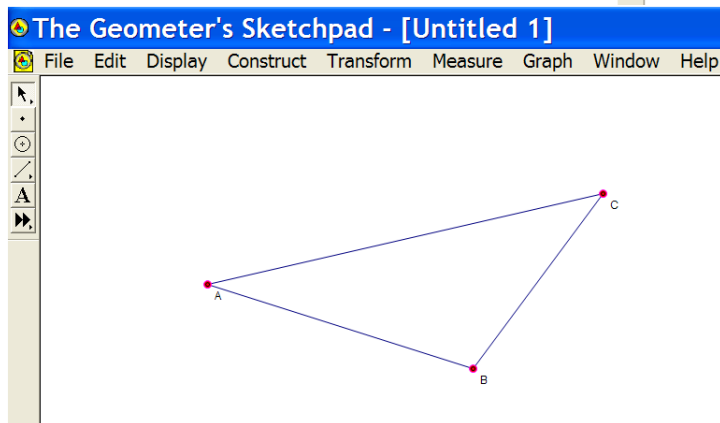
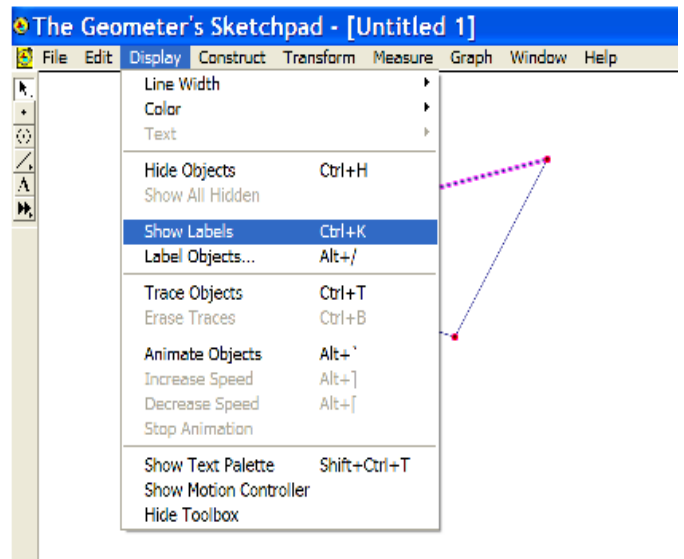
Stay on the line segment tool. Put the mouse over one of the endpoints of the segment and you will see a blue halo around the point. Click the point and drag your mouse to where you want the end of that segment, then click to end the segment. It should look similar to this:



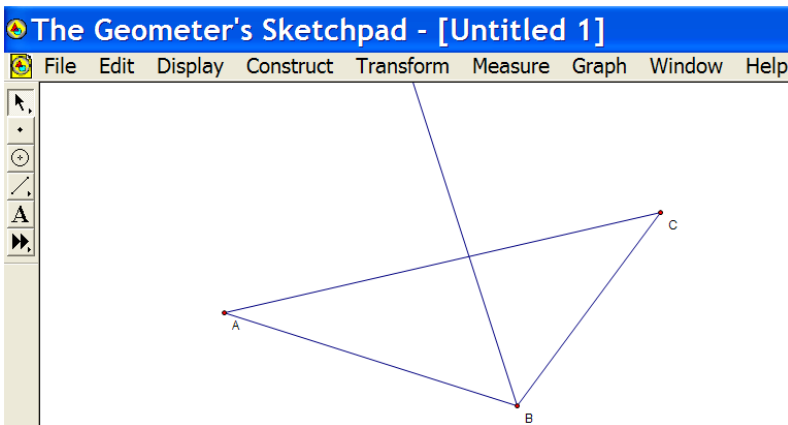
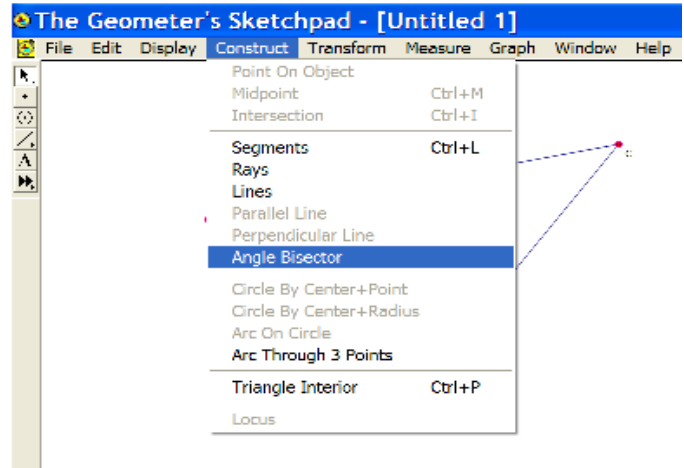
Now, connect the two segments. Put the mouse over one of the points and when you have a blue halo around the point, click and drag until you get a blue halo around the remaining point. Click to end the segment. Click on the arrow selection tool, and then click somewhere in the white space to deselect everything. It should look similar to this: →



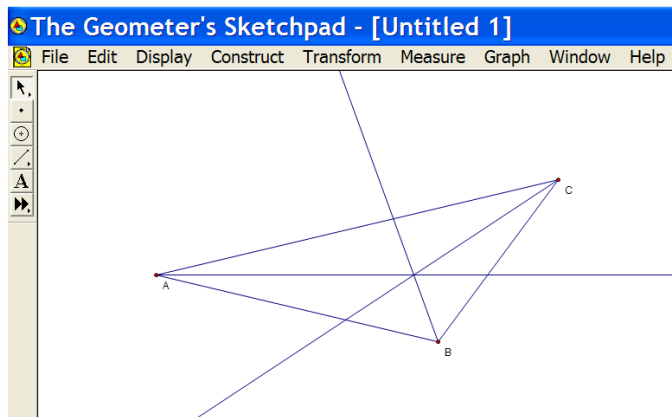
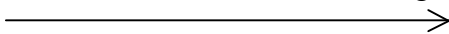
Now your triangle is made. Before proceeding to drawing the bisectors, we must label your triangle. In order to do this, click on the arrow tool in your tool bar on the left side of the screen . Then, click on all three points until they all have a pink halo around the points. When all three points are highlighted, click on **Display** at the top, then click on **Show Labels**. Your sketch should look similar to the following: ↓



Before proceeding, click somewhere in the white space to deselect everything. Now we are going to make our angle bisectors. In order to do this, we need to highlight the points in a specific order, let's say $\angle ABC$. Make sure the arrow tool is still selected and click on the points in the order of A, B, C so that all the points have a pink halo around them. Click on Construct and then click on Angle Bisector. Your sketch should look similar to the following:



Repeat the previous step to get angle bisectors for all three angles. Remember, the order in which the points are selected is important. Your sketch should look like the following:



Now you have a triangle with three angle bisectors! Save your work and answer the following questions.

QUESTIONS

1. Notice that the three angle bisectors intersect at a point. There is a name for this point. If you don't know it, open up an Internet browser and search for the name of the point of intersection.

Point of intersection of the three angle bisectors - _____

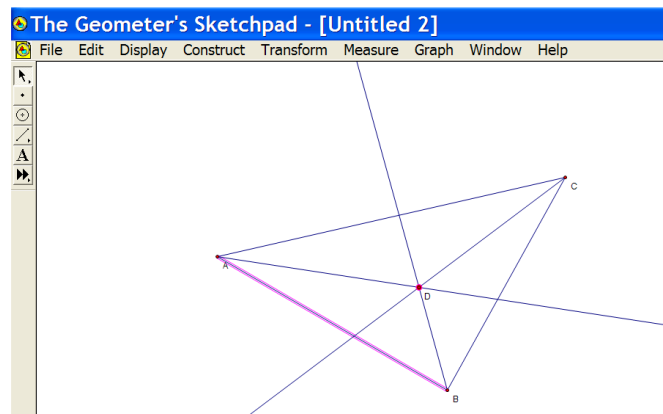
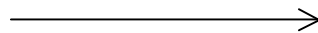
** This point is the center of the triangle's incircle, which is the largest circle that will fit inside the triangle and touch all three sides.

Label this point on your sketch. This can be done the same way that the points of the triangle were labeled. Make sure the arrow tool is selected, then click on the point and make sure it has a pink halo around it. Then click on Display and Show Label.

Let's construct the incircle!

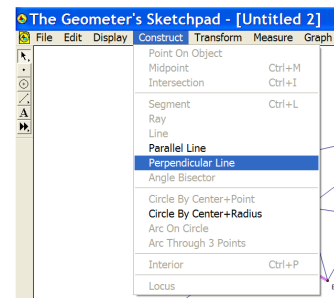
Step 1:

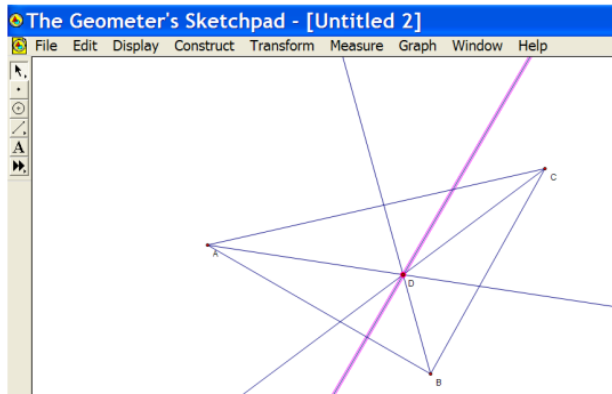
From Geometer's Sketchpad, click on the arrow tool on the left and then click in any of the white space to deselect everything. Then click on the incenter so it has a pink halo around it, and then click on one of the sides of the triangle. Your sketch should look like the following:



Step 2:

Click on the Construct menu and click on Perpendicular line. Your drawing should look like the following: (next page)





Step 3:

Click on the circle selection tool in the left tool bar.

Then, put your mouse over the incenter until it is highlighted pink, and then click and drag the mouse until the point on the circle reaches the intersection of the selected side of the triangle and the perpendicular line.

When both the selected side of the triangle, and the perpendicular line are highlighted in blue click again. Your circle should be highlighted in pink.

