

Activity 3: Exploring Interior Angles of Triangles

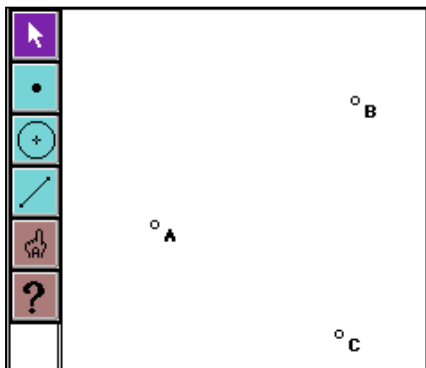
Software: Geometer's Sketchpad

The purpose of this activity is to discover some properties about the interior angles of a triangle using Geometer's Sketchpad.

Launch the program Geometer's Sketchpad by double clicking on its icon. After the Geometer's Sketchpad window appears, go to the **Display** menu and choose **Preferences**. Make sure that the **Autoshow Labels** for **Points** is checked.

Construct a triangle.

1. Place 3 points in the Sketchpad Window.



- Click on the point tool. Move the pointer to the sketch plane. The pointer changes to a crosshair shape. Click anywhere in the sketch plane. You should see point A appear.
- Move the pointer in any direction and repeat the process until you have points A, B, and C appear in the plane. Notice that point C is highlighted (or selected). You can de-select that point and select a different point by moving the crosshair and clicking on another point.

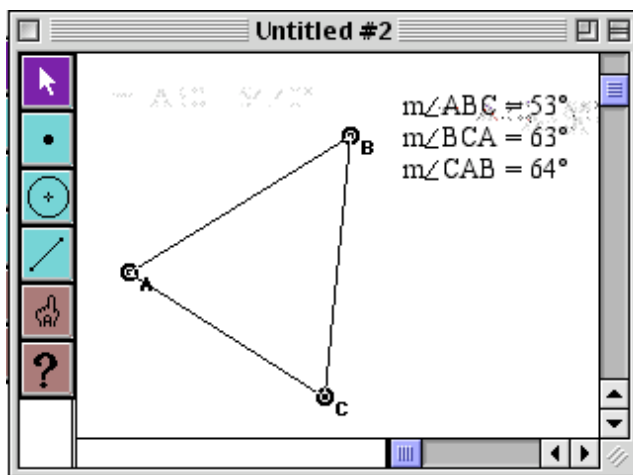
2. Construct line segments AB, BC, and CA.

- Choose the pointer tool and click on A.
- While holding down the shift key, click on point B. Points A and B should be highlighted.
- From the **Construct** menu choose the **Segment** command. You should see line segment AB.
- Unhighlight (de-select) the two points. This can be done by clicking the mouse somewhere on the plane outside the construction.
- Repeat the process for the other two sides.

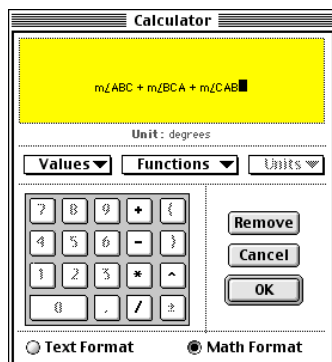
• Measure the interior angles.

1. Highlight angle ABC. (While you hold down the shift key, click on the points A, B and C - in that order.) Go to the **Measure** menu and choose **Angle**. The Sketchpad will print the angle measure for ABC in the window. Repeat for the other two angles.

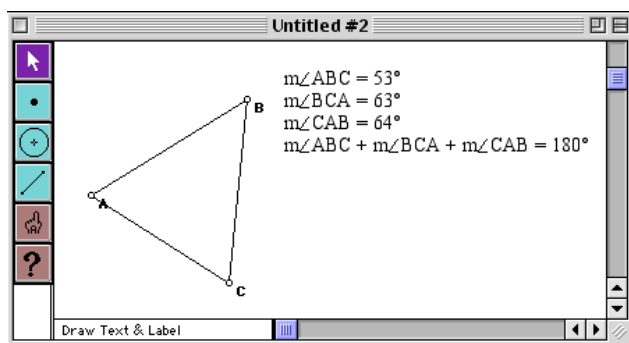
2. Use the **Calculate** command in the **Measure** menu to find the sum of the interior angles.



- Highlight the 3 measurements. (Hold the shift key down and click on each measurement.)
- Choose **Calculate...** from the **Measure** menu. A calculator appears. Choose the angles from the **values** menu.



After you click OK, you should see



3. Drag one the vertices. What do you notice? (the angle measurements dynamically change while the sum of the angles stays the same. In other words, the sum of the interior angles of a triangle always equals 180 degrees.) Why does that work? For a demonstration see the website

<http://www.utc.edu/~cpmawata/instructor/tsukuba5.htm>