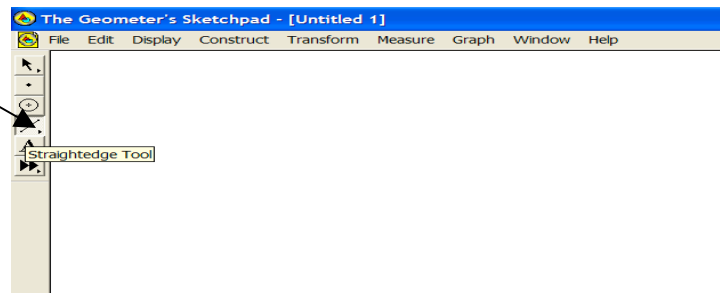


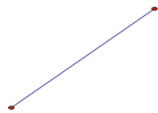
Law of Sines Investigation

Directions: In this activity, you will use the Geometer's Sketchpad program to explore the properties of oblique triangles. Follow the steps listed below to complete this activity.

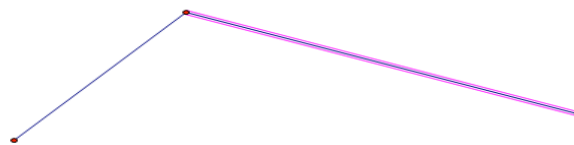
1. Open the Geometer's Sketchpad program.
2. Maximize the sketchpad window.
3. From the action buttons running down the left side of the screen, select the **Straightedge Tool**.



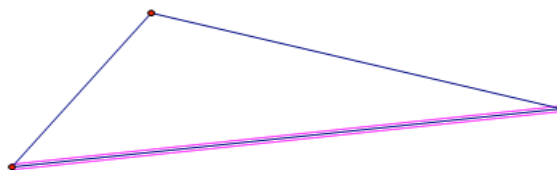
4. Click on a point in the sketchpad. A point should appear. Then click on another point in the sketchpad to create a segment.



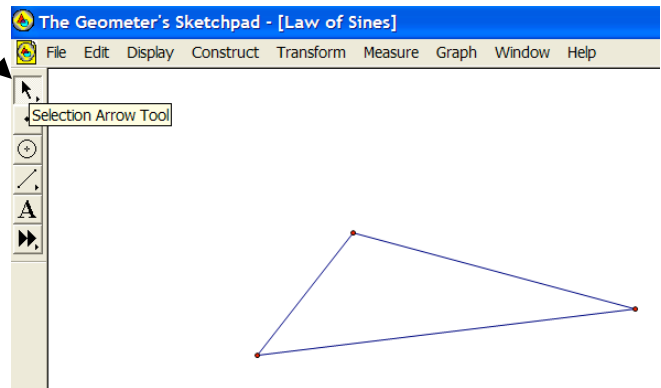
5. Click on the one of the endpoints of the segment. It should be highlighted in light blue. Now click on another area of the sketchpad to create a second segment.



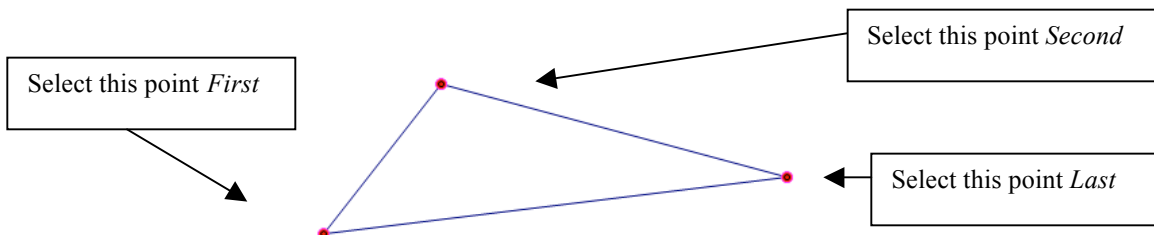
6. Create a triangle by creating a connecting segment between the other two endpoints. Make sure to click directly on the endpoints when doing this.



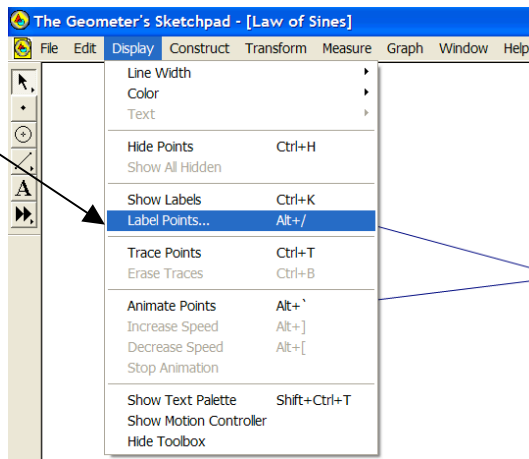
7. Click on the **Selection Arrow Tool** from the toolbar on the left side of the screen.



8. Click on a blank area of the sketchpad to deselect all points and segments.
9. Click on each of the three points in your triangle, starting with the lower left point. Make sure you select only the points, and not the segments.



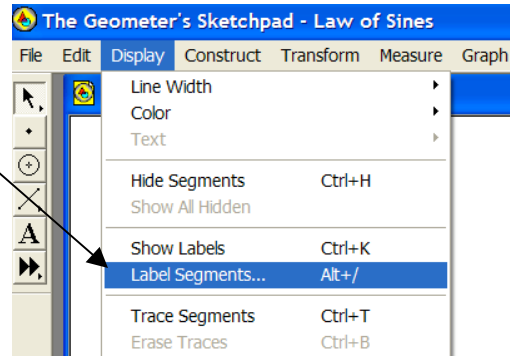
10. Click on the **Display** menu. Select *Label Points*. A window will appear. The first label should be "A." Click *Ok*.



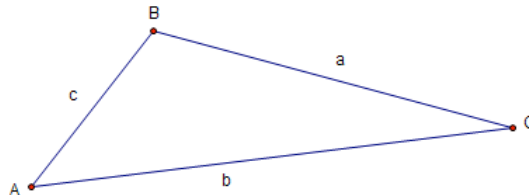
11. Your points should now be labeled A, B, and C. If you move your mouse over the letter in each label, the cursor will change to a hand. You can click-and-drag the label to a different location near the point if you so desire.
12. Click on a blank area of the sketchpad to deselect all points.

13. Click on the segment opposite to point A. Then click on the segment opposite to point B. Lastly, click on the segment opposite to point C.

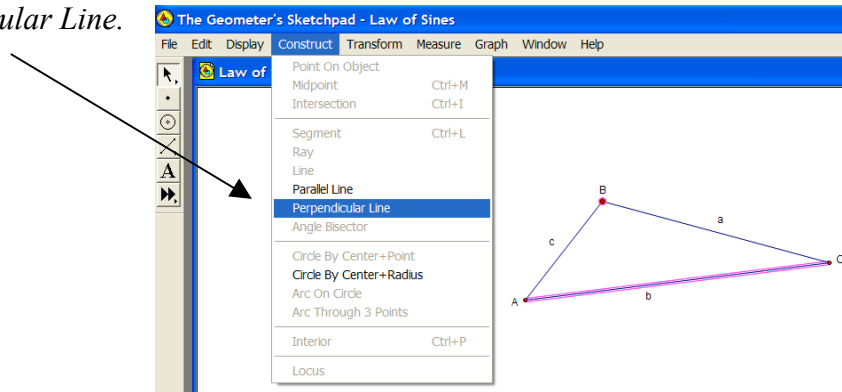
14. Open the **Display** menu. Select *Label Segments*. Label the first segment “a” and then click OK. Rearrange your labels if necessary. Click on a blank area of the Sketchpad to deselect all segments.



15. Your figure should now appear like this:

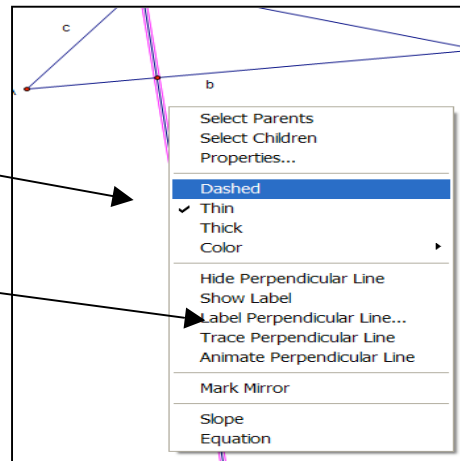


16. Click on point “B” and segment “b.” Open the **Construct** menu and click on *Perpendicular Line*.

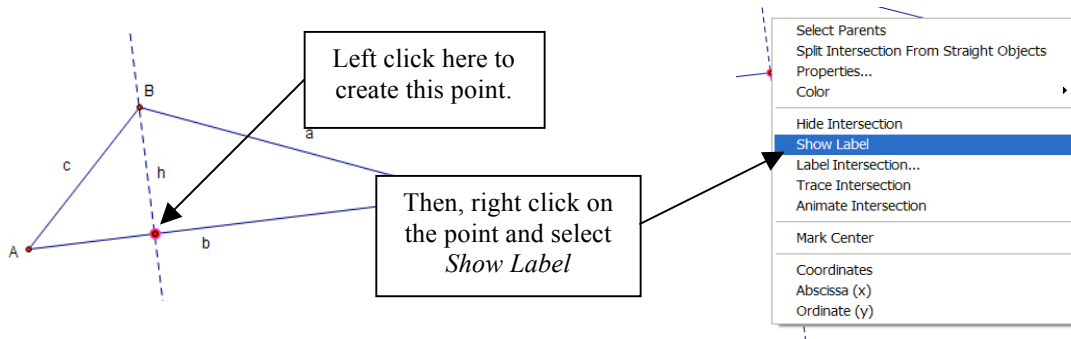


17. Right click on the line you have just created. Click on the *Dashed* option.

18. Right click on the line again. Select *Label Perpendicular Line*. In the window that appears, label the line “h” and click OK. Rearrange the the label so that it appears in the interior of the triangle.

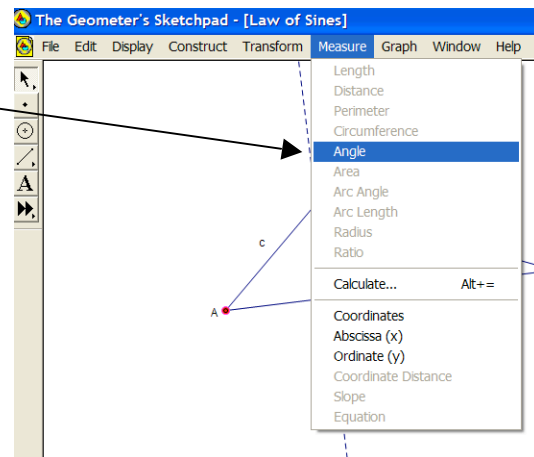


19. Click on a blank space in the sketchpad to deselect all objects.
20. Click on the intersection of segment “b” and line “h.” A point should appear. Right click on this point and select *Show Label*. The point should be labeled “D.”



21. Click on a blank space in the sketchpad to deselect all objects.

22. Click on point B, then point A, and then point C. Open the **Measure** menu, and click on *Angle*. The measure of the angle should appear in the upper left corner of the sketchpad.



23. Click on a blank space in the sketchpad to deselect all objects.

24. Click on point A, then point B, and then point C. Open the **Measure** menu, and click on *Angle*. Click on a blank space in the sketchpad. Then click on point B, then point C, and then point A. Open the **Measure** menu, and click on *Angle*. The measures of all the angles in the triangle should now appear in the upper left corner of the sketchpad.

25. Click on a blank space in the sketchpad. Click on segment a. Open the **Measure** menu, and click on *Length*. Repeat this step for segment b and segment c.

26. Click on a blank space in the sketchpad. Click on point B and then point D. Open the **Measure** menu, and click on *Distance*. Your figure should now appear like this:

$m\angle BAC = 39.63^\circ$
 $m\angle ABC = 119.51^\circ$
 $m\angle BCA = 20.86^\circ$
 $a = 5.47 \text{ cm}$
 $b = 7.46 \text{ cm}$
 $c = 3.05 \text{ cm}$
 $BD = 1.95 \text{ cm}$

