

**Objective**

To conjecture about the characteristics of triangle midlines

**Procedure**

1. Open SketchPad.
2. Type a complete heading and save the file as "LastnameMidline" in your folder on the server.
3. Draw a triangle.
4. Select all three sides and construct the midpoints (ctrl-M).
5. With the midpoints still selected, construct the midlines (Ctrl-L). This will result in four triangles.
6. Measure and organize your work. Follow the example:

The Geometer's Sketchpad - [Triangle Midline]

File Edit Display Construct Transform Measure Number Graph Window Help

Stu Dent  
Ms. T Chur  
Adv Geo - 9  
T 21 Jan 14

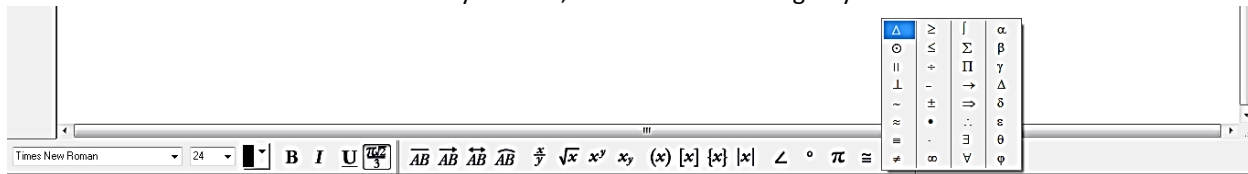
Triangle Midline Lab

Sum of the interior angles of the triangle:

Big triangle: $\triangle DEF$	Upper triangle: $\triangle DAB$	Lower left triangle: $\triangle ACE$	Center triangle: $\triangle ABC$	Lower right triangle: $\triangle BCF$
$m\overline{ED} = 7.45$ cm	$m\overline{DB} = 2.37$ cm	$m\overline{EC} = 2.49$ cm	$m\overline{AB} = 2.49$ cm	$m\overline{CF} = 2.49$ cm
$m\overline{DF} = 4.73$ cm	$m\overline{AB} = 2.49$ cm	$m\overline{CA} = 2.37$ cm	$m\overline{BC} = 3.73$ cm	$m\overline{BF} = 2.37$ cm
$m\overline{FE} = 4.97$ cm	$m\overline{AD} = 3.73$ cm	$m\overline{AE} = 3.73$ cm	$m\overline{CA} = 2.37$ cm	$m\overline{BC} = 3.73$ cm
$m\angle AEF = 38.66^\circ$	$m\angle ADB = 41.04^\circ$	$m\angle AEC = 38.66^\circ$	$m\angle CAB = 100.30^\circ$	$m\angle BFC = 100.30^\circ$
$m\angle ADB = 41.04^\circ$	$m\angle DAB = 38.66^\circ$	$m\angle EAC = 41.04^\circ$	$m\angle ABC = 38.66^\circ$	$m\angle CBF = 41.04^\circ$
$m\angle BFC = 100.30^\circ$	$m\angle DBA = 100.30^\circ$	$m\angle ACE = 100.30^\circ$	$m\angle ACB = 41.04^\circ$	$m\angle BCF = 38.66^\circ$
$m\angle AEF + m\angle ADB + m\angle BFC = 180.00^\circ$		$m\angle AEC + m\angle EAC + m\angle ACE = 180.00^\circ$		$m\angle BFC + m\angle CBF + m\angle BCF = 180.00^\circ$
$m\angle ADB + m\angle DAB + m\angle DBA = 180.00^\circ$		$m\angle CAB + m\angle ABC + m\angle ACB = 180.00^\circ$		

**Special symbols**

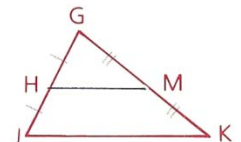
- To type a triangle symbol, show the text toolbar. (Look in the Menu under Display, or Shift+Ctrl+T)
- Click on the Symbolic Notation icon (looks like a fraction: pi root 2 over 3). You must have a text box open and ready to type in order for this to show. Click the arrow at the far right, and additional symbols will show. Select the one you want, in this case the triangle symbol.



7. Measure all 12 segments. You will need to create the smaller segments determined by the midpoints, or measure the distances.
8. Measure all 12 angles.
9. Add the interior angles of the triangle using Numbers (from the menu) and Calculate.
10. Create a tool, and print the construction steps. You will need to hand the steps in with the lab.

**Conclusions**

1. What is the sum of the measure of measures of the interior angles of any triangle? \_\_\_\_\_
2. What inference can you make about the midline? Fill in the blanks:



**A segment joining the midpoints of two sides of a triangle is \_\_\_\_\_ to the third side, and its length is \_\_\_\_\_ the length of the third side. (Midline theorem)**

2. Are any of these triangles congruent? If yes, which? \_\_\_\_\_

**Extension, If time permits:**

1. Construct a trapezoid.
2. Construct the midpoints of the non-parallel sides. Create the Midline (by connecting the midpoints of the non-parallel sides).
3. Measure the parallel sides and midline.

*Conclusion*

What is the mathematical relationship between the bases and the midline? (Hint: Average)

***A segment joining the midpoints of two non-parallel sides of a trapezoid is \_\_\_\_\_ to the bases,  
and its length is \_\_\_\_\_ the length of the bases. (Midline theorem)***

Print and hand in the Sketch and the Script.

Ms Kresovic's  
students will  
meet in the  
Doerr Lab  
today.