4F: Exploring Midsegments with G.S.P.

In this activity, we will use Geometer’s Sketchpad to discover some useful properties of triangle midsegments.

**Definition: Midsegment –** A segment that connects two *midpoints* in a polygon.

Follow the steps below and write a response to the questions as you go.

**Construction 1: Length of the midsegment**

1. Construct .
2. Construct the midpoint of side and label it point by selecting the line and choosing [midpoint] from the [construct] menu.
3. Construct the midpoint of side and label it point
4. Now construct the midsegment .
5. Measure the length of the midsegment by selecting the segment and going to [Measure], [Length].
6. Measure the length of side .
7. Now select [Number], [Calculate] and type “2\*” then click on which is on the main screen.
8. Move points and and observe these measurements.  
   *How does the length of midsegment compare to the length of the opposite side ()?*

**Position of the midsegment**Continue with the same drawing and do the following steps.

1. Click on and choose [Measure], [Slope].
2. Now do the same to measure the slope of .
3. Move points and and observe these slopes.  
   How does the slopes compare?  
   *What does this tell you about the midsegment and the opposite side ()?*

|  |
| --- |
| ***Triangle Midsegment Theorem:***  The midsegment of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the opposite side and it  is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of it’s length. |

**Extra: Midsegment Triangles**Continue with the same drawing and do the following steps.

1. Construct the other two midsegments in the triangle.
2. The three midsegments of the triangle make a new triangle.   
    *How does this triangle compare to the original triangle?*
3. Click on points andand choose [Construct], [Triangle interior].
4. Select the shaded area and choose [Measure], [Area].
5. Repeat these two steps to find the area of the triangle made by the midsegments.  
   *How do these two areas compare?*