Objective: To create an applet that proves the Triangle Angle Sum Theorem.
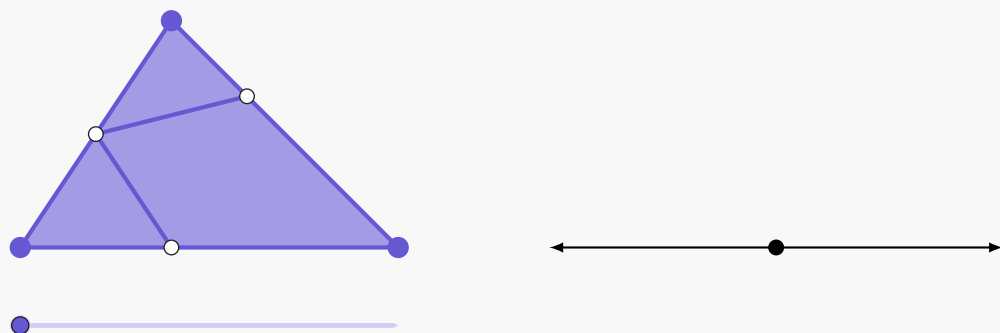
Mini-Objective 1: To create a triangle with vertices that are movable in the x-direction only.

Step 1: Select the Parallel Line tool and create a line parallel to the x-axis. Hide point A.

Step 2: Select the Point on Object tool and place two points on the x-axis and one point on the line parallel to the x-axis. Hide the line.
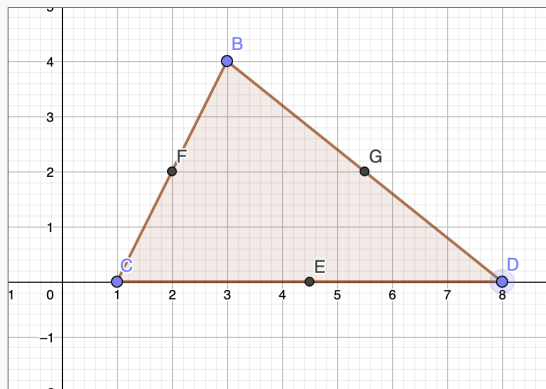
Step 3: Select the Polygon tool and then select points B → C → D → B to create a triangle.
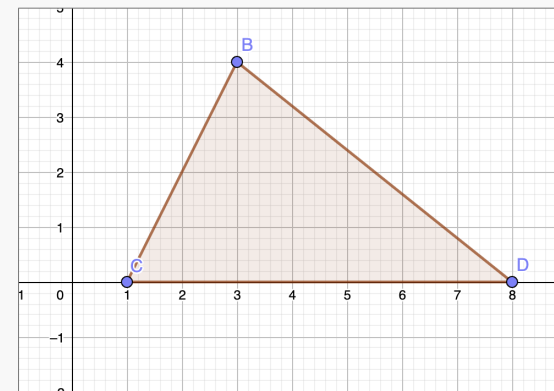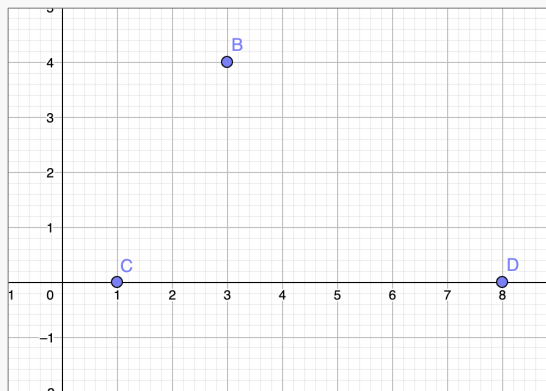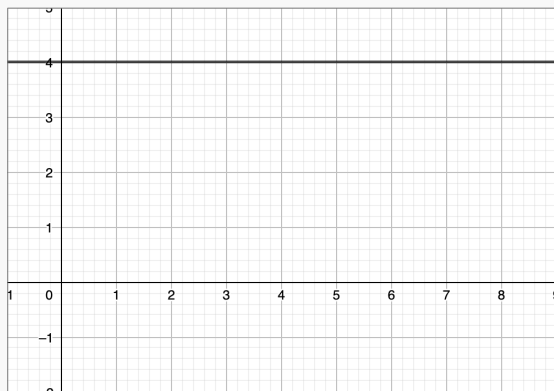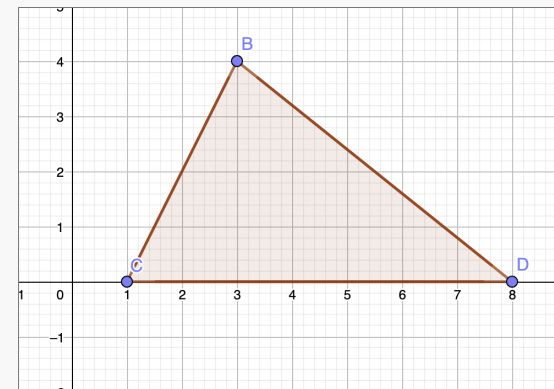
Mini-Objective 2: To divide the triangle into three adjustable segments.
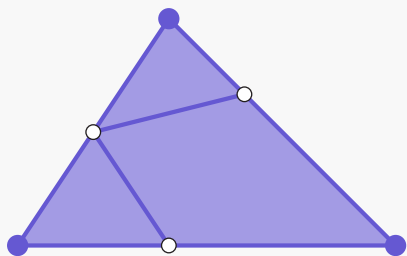
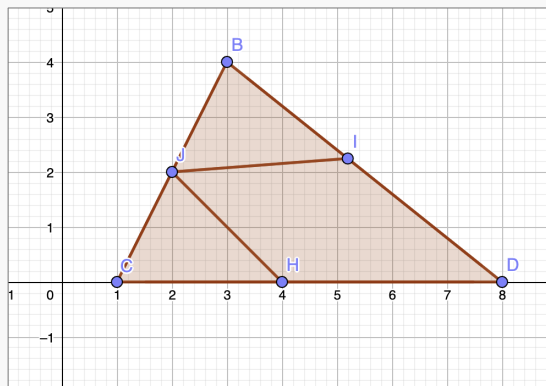**Step 4:** Select the Midpoint tool and select each segment of the triangle.

Step 5: Select the Dilate from Point tool and then dilate each segment from its midpoint by a scale factor of 0.85. Hide all points except for the triangle's vertices.

Step 6: In the algebra window, define the following points:

Step 7: Select the Polygon tool. Select points B → F → G → B. Select points C → E → F → C. Select points D → E → F → G → D.

Mini-Objective 3: To transform each angle-segment onto a single vertex by using a slider.

+	Point(b')	⋮
	$\rightarrow$ = $(1.53, 0)$	

+	Point(c')	⋮
	$\rightarrow$ = $(3.38, 3.7)$	

+	Point(d')	⋮
	$\rightarrow$ = $(1.15, 0.3)$	

Step 8: Select the Segment tool. To the right of the triangle, create a segment by selecting two coordinates on the x-axis. Select the midpoint tool and then select the segment.
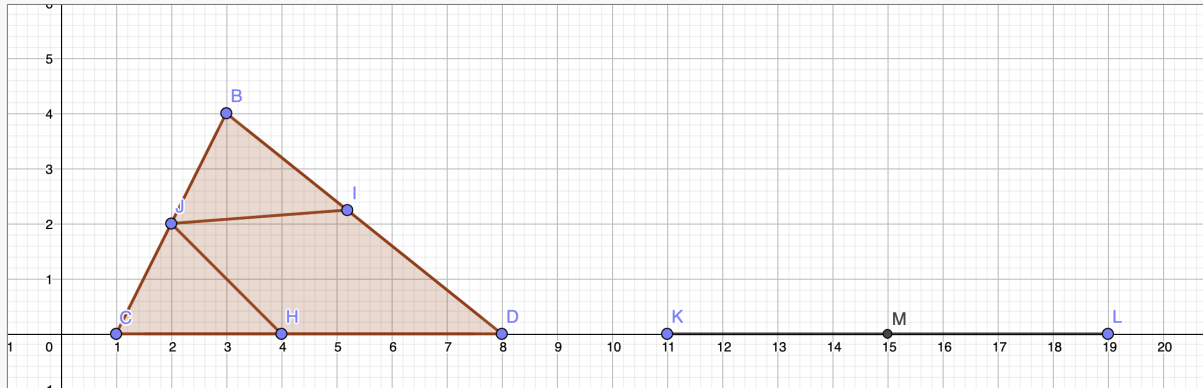
Step 9: Select the Slider tool and create a slider with the following parameters:

Slider

Name

$a = 1$

● Number   ○ Angle   ○ Integer

Interval	Slider	Animation
Min	Max	Increment
0	1	0.1

CANCEL   OK

Step 10: In the algebra window, define the following vectors and transformations:

$+$ $u = Vector(C, M) \cdot a$

$\rightarrow$ $(14, 0)$

$+$ $Translate(t2, \; u)$

$\rightarrow$ 3

$+$ $v = Vector(D, M) \; \cdot \; a$

$\rightarrow$ $(7, 0)$

$+$ $Translate(q1, v)$

$\rightarrow$ 7.93

$+$ $Rotate(t3, \; -180 \; deg \; \cdot \; a, \; Midpoint(B, M))$

$\rightarrow$ 3.07

Step 11: Customize the appearance to your liking: