Point Location Challenge Questions

Both images on the right state that 9 lines were used to create the image. Visual inspection suggests that each has only 8 lines.

1. Verify that it takes 9 moves to create thee image in each instance by placing numbers from 1 to 9 next to the location of each endpoint.

HINT: It may help to sketch in the square vertex frame in a different color.

ASSUME: The enclosed triangular area in Image 2 is not part of the image.

2. With this triangular area excluded from Image 2, what is the area of each image? Which image has greater area?

3. How much larger is the larger image? Provide this answer in square units, as well as in proportional terms.

FACTS:

   a. A polygonal area can be cut into a number of non-overlapping triangles and the area of the whole is the sum its parts.

   b. The area of a triangle is:
           ½ base times height

   c. If two triangles have the same base and same height, they have the same area.

4. Using these facts, show the left-over area of the larger area image as part of that image. (Put another way, imagine you had a pair of scissors and removed equal area triangles from each image. What would be left over once all pieces of the smaller image is removed?)

HINT: There are multiple answers here, but one is particularly elegant.

NOTE: The final two pages provide large-scale versions of both images just in case you want to use actual scissors to attack this problem.

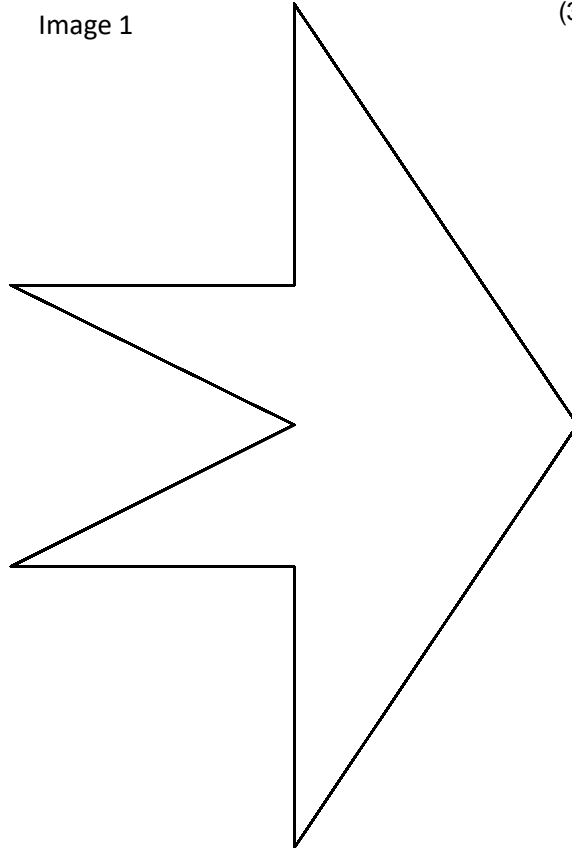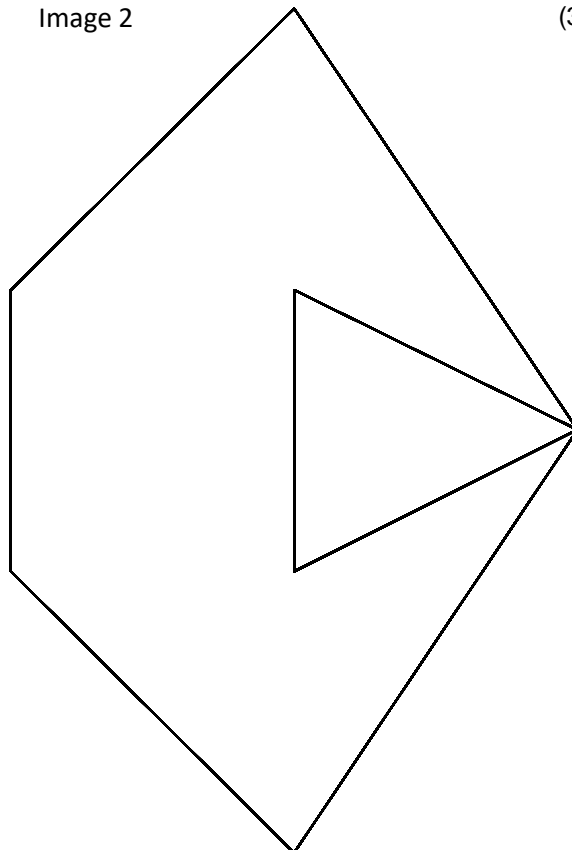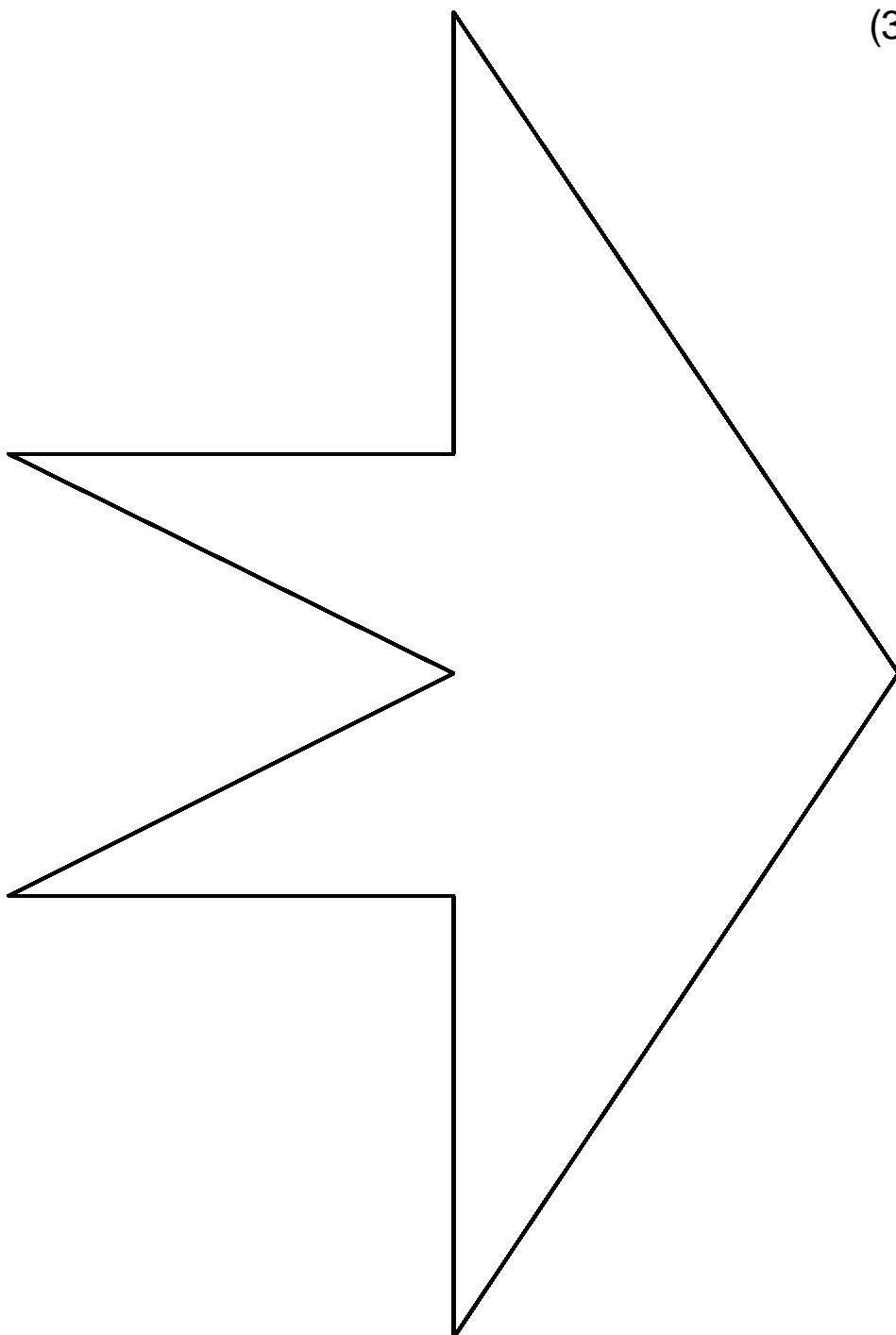Image 1   (3,4,4), 9 lines

Image 2   (3,8,4), 9 lines

(3,4,4), 9 lines

(3,8,4), 9 lines