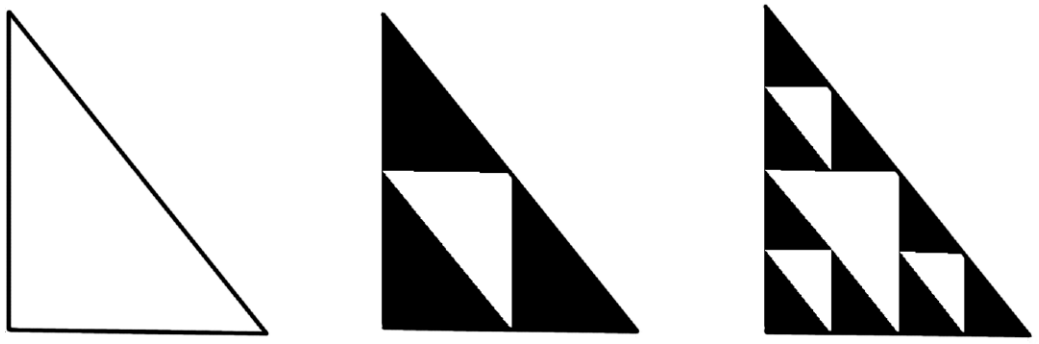
SPATIAL SENSE AND GEOMETRY
Macro IIA – Recognize, Visualize, Analyze, and Apply Geometric Properties

Directions: Think about what you have learned in **You Be the Judge** and **You Be the Teacher** about writing complete, accurate, and effective answers. Read and think about the task below before writing your answer and reasons in the space provided.

The Task: To form the pattern shown below, start with a triangle (Stage 0) and locate the midpoint of each side. Then connect the midpoints to form smaller triangles and remove the middle triangle. This completes Stage 1. To create Stage 2, locate the midpoint of each side of the remaining triangles and connect the midpoints to form smaller triangles. Again, remove the middle triangle. At each stage the triangles decrease in size, but increase in number.

Stage 0 Stage 1 Stage 2



- How many shaded triangles are there in Stage 3?
- If the pattern is continued, how many small shaded triangles will appear in Stage 4?
- At what stage will there be 729 shaded triangles? Support your answer.
- Will there ever be a stage with exactly 300 shaded triangles? Support your reasoning.