

### Challenge Questions for File 3

The image below is based on  $S = 4$ ,  $P = 5$ , and  $n = 3$  using File 3. The vertex frame jumps to the next vertex then goes to the center of the circle,  $(0, 0)$ , and back to that vertex before jumping to the next vertex (if you are confused by this, see the vertex jump pattern handout for further information).

1) Place numbers 1-5 next to the endpoint of the first five segments.

**FACT:** This image has a number of triangles but only ONE is equilateral.

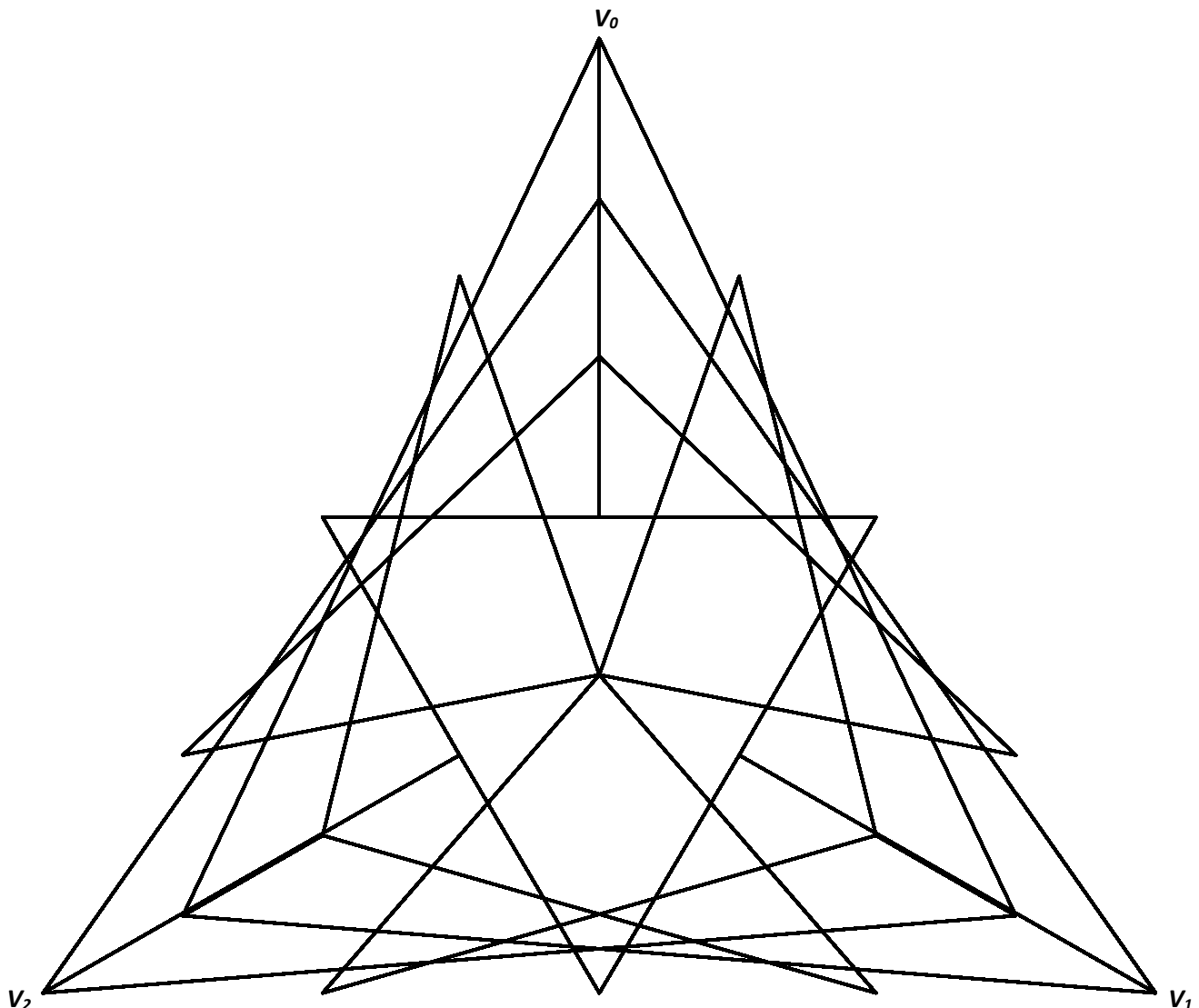
2) Was the equilateral triangle laid out using 3 consecutive segments?

3) When is the first third of the equilateral triangle laid out (i.e. what section numbers)?

3) What is the area of the equilateral triangle?

4) How many right triangles are there? Place an R next to each right angle.

5) Find and label the right triangles at their sharpest apex angle. Label those with the sharpest angle, S, next sharpest, M, and least sharp, L.



**FACT:** The vertex frame in this instance are  $V_0 = (0, 1)$ ,  $V_1 = (\frac{\sqrt{3}}{2}, -0.5)$  and  $V_2 = (-\frac{\sqrt{3}}{2}, -0.5)$ .