

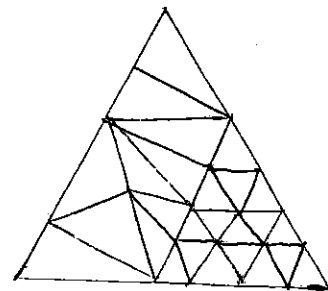
UW Math Circle  
Week 4

1. How many ways can a regular  $n$ -gon be divided into  $n - 2$  triangles if  $n = 3$ ? What if  $n = 4$ ? What if  $n = 5$ ? What if  $n = 6$ ? Count different orientations as separate ways!

2. Grima is building a staircase of length 4 and height 4. How many ways can he build the stair case if he can only use 4 rectangles? The example for a staircase of height and length 2 is given below.



3. Color every vertex of the triangle below so that: the top vertex is red, the bottom left vertex is green, the bottom right vertex is blue, any vertex on the left side is red or green, any vertex on the right side is green or blue and any vertex on the bottom is red or blue. The vertices inside the triangle can be any color. Can you find a coloring so that there is no triangle with one vertex of each color?



4. How can you use Pascal's Triangle to calculate the powers of 11?

