

## Part I: Reading (due at the beginning of class Wednesday, April 17)

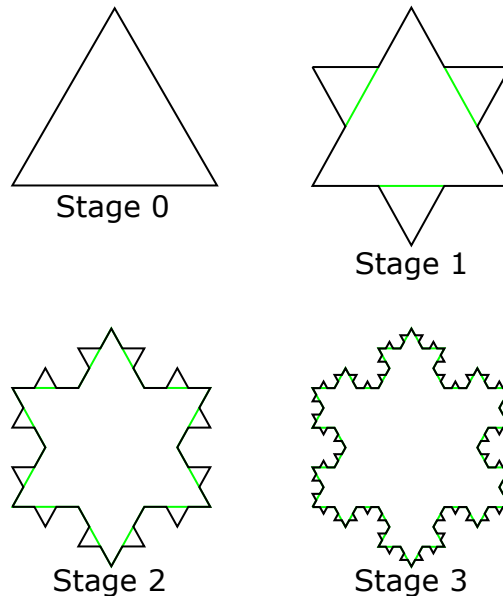
In the green Taylor polynomials handout, work through the end of page 3 (the page that has the number 3 at the bottom of it).

## Part II: Exercises

No Part II this time.

## Part III: Homework Problems (due Wednesday, April 17 at the beginning of class)

- The Koch snowflake curve is created by taking an equilateral triangle, dividing each side into three equal pieces, attaching an equilateral triangle to the middle third on each side, and then repeating this process infinitely. Here's a picture of the first four steps in this process:



The equilateral triangle in Stage 0 has area 1.

- (a) Fill in the rest of the following table

Stage #	Number of Triangles added at this stage	Area of one of the new triangles added	Total area of the triangles added at this stage
0	1	1	1
1	3	$\frac{1}{9}$	$3\left(\frac{1}{9}\right) = \frac{1}{3}$

2			
3			
4			

- (b) Since the Koch snowflake is the curve you get after infinitely many steps, we can write the area the curve encloses as an infinite series. It's a bit easier to do this by ignoring the original triangle and just finding the total area of the new triangles and then dealing with the original triangle at the end, so first write an infinite series for the *added* area (as in, leave off the +1 at the beginning—in other words, we're ignoring Stage 0 right now).
- (c) Find the sum of the infinite series you just wrote.
- (d) Now find the total area enclosed by the Koch snowflake curve by adding the area of the original triangle to the area you just found.
2. In a slight change from the previous problem, we're now going to assume that *each edge of the original equilateral triangle in Stage 0 is 1 unit long*. Note: the number of triangles you're adding in each stage does not change from that in previous homework, so it's already filled in for you in the table.

- (a) Fill in the following table for each stage.

Stage #	Number of Triangles added at this stage	Length of one side of triangle added	Perimeter of whole figure at this stage
0	1	1	3
1	3		
2	12		
3	48		
4	192		

- (b) Write an infinite series for the perimeter of Koch's snowflake (the completed curve).
- (c) Find the sum of the series you just wrote.