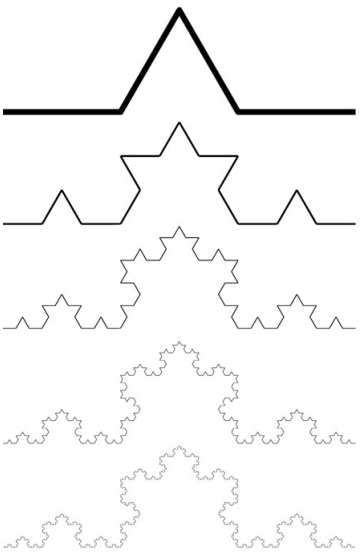
CS-AD-216: Foundations of Computer Graphics

Assignment 1, Due: September 15

Instructions:

- Please read Chapter 2 of the textbook carefully before attempting the exercises.
- Assignments can be submitted in groups of at most three. The purpose of groups is to learn from each other, not to divide work. Each member should participate in solving the problems and have a complete understanding of the solutions submitted.
- Submit your assignments as a zip file (one per group) which includes the Common directory and a separate directory for each of the assignments so that I can run your code by just extracting your files and double-clicking the html files.

Problem 1 (10 points)**.**
The goal of this exercise is to display a Koch curve. We construct the curve by iteratively refining the shape. We start with a horizontal line segment. Then we replace the middle third of the segment by two segments (see figure below) which form an equilateral triangle with the middle third we replaced. We now have a curve with four segments. We the repeat the procedure with each of these segments to get a curve with 16 segments. In the real Koch curve, this process is repeated an infinite number of times. However, since we have only finite amount of time available, we will do it only a finite number of times. In your code, you should have a variable called `levels` which determines how many times the procedure is repeated. You can draw a polylines in WebGL by using the primitive `gl.LINE_STRIP` in `gl.drawArrays(...)`.



This video is fun to watch if you want to know a bit more about fractals: `https://www.khanacademy.org/math/geometry/basic-geometry/koch_snowflake/v/koch-snowflake-fractal`.

Problem 2 (10 points)**.**
Write a program which displays two disjoint regular pentagons of different sizes and different colors, one centered at the center of the canvas and the other revolving around it.