Math 3626: Assignment 2

In this homework we will learn some details about Mathematica and how to write programs in Mathematica. Make sure to open the 02-sample-polygon.nb, read through it carefully and execute all statements. Then answer the following questions:

1. Describe the following Mathematica commands, both in how they are used and what they do: Do, Map, Polygon, Table, RGBColor, Graphics
2. Use the Do function to print out the numbers from 1 to 20 together with each number’s square and cube.
3. Use the Table function to generate (a) a list of consecutive numbers from 1 to 20, (b) a list of even integers from 2 to 20, and (c) a list of every 6th number that is less than 20, starting with 3.
4. Which of the following functions accepts a list as input: Cos, Sqrt, Abs, and Erf (by the way, what is Erf?)
5. Define a function that takes as input an integer and displays as output that integer, together with its square and cube. Then use the Map function to map that function over a list of consecutive integers from 1 to 20 to generate the same output as in (2).
6. Draw by hand the points in the plane that you get when you execute the function VectorAtAngle for the angles Pi/4, 3 PI/4, 5 Pi/4, and 7 Pi/4. Confirm your answer with Mathematica.
7. Suppose you create a list of points on the unit circle by executing the VectorAtAngle function over the list of angles {0, 2 Pi/10, 4 Pi/10, 6 Pi/10, …, 18 Pi/10}. What happens if you multiply the list of angles by 3, then draw the VectorAtAngle for the new list? What if you multiply the (original) list by 5, then draw VectorAtAngle for the resulting list.