Math 100 Project on Fractals (Pelsmajer)

1. Read and Understand Chapter 13 "Mandlebrot Set" of Cleve Moler's Experiments with MATLAB. In the end, I expect you to be able to explain every bit of the text, when asked.

You may need to review (or learn about) complex numbers. You should come to me with questions about anything that you don't completely understand. We may have to meet a few times to get it all straight.

2. From the end of the chapter, do all the exercises. You don't need to understand everything perfectly to do these exercises, so you can work on these as soon as you've read the chapter once.

3. Learn about Newton Fractals (wikipedia is fine), and then use MATLAB to generate some nice pictures. Your code should be flexible enough that it you can easily modify it to use whatever polynomial is desired. (Start with Moler's code, and modify it appropriately.)

4. Understand the connection between Newton's Method (for finding real roots) and the above pictures. Write a MATLAB program that demonstrates this by combining a graph of a polynomial (with real domain) and coloring the real line according to the regions of convergence. Your code should be flexible enough that it you can easily modify it to use whatever polynomial is desired.

You may need to review or learn Newton's Method (usually taught in Calculus I).