Homework Seven
Chaos and Fractals
College of the Atlantic

Due Friday, October 27, 2023

There are two parts to this assignment!

Part 1: WeBWorK. Do homework 07 on the WeBWorK page.

Part 2: Problems from the Textbook. Here are some instructions for how to submit this part of the assignment.

- Do the problems by hand using pencil (or pen) and paper. There is no need to type of this assignment.
- Make a pdf scan of your work using genius scan or some similar scanning app. Please make the homework into a single pdf, not multiple pdfs.
- Submit the assignment on google classroom.

Here are some "textbook" problems, which aren't actually from the textbook.

1. Consider the following complex numbers:

$$z_1 = -4 - 2i\ , \quad z_2 = 3i\ , \quad z_3 = 2 + 0.5i\ , \quad z_4 = -2 + 0.5i\ , \tag{1}$$

$$z_5 = -2i\ , \quad z_6 = 2 + 0.5i\ , \quad z_7 = 4 - 2i\ , \quad z_8 = -4 - 2i\ . \tag{2}$$

   (a) Plot the above numbers[1] on the complex plane.
   (b) Connect the dots. The pattern should look familiar.

2. Consider the function $f(z) = iz$.

   (a) Determine first four iterates of $z_0 = 3$.
   (b) Determine first four iterates of $z_0 = 2i$.
   (c) Plot the iterates for each of the seeds in the complex plane.
   (d) How would you describe the behavior of the orbits?

Here are textbook problems from the actual textbook:

Chapter 21:

- Chapter 21, problem 1
- Chapter 21, problem 2
- Chapter 21, problem 3
- Chapter 21, problem 4
- Chapter 21, problem 5

The textbook problems should be very quick. If they're not quick, you might be over-thinking things. Check in with one of us for help!

[1] Yes, I know that there are two numbers that are there twice.