

Homework 4

Math 469 (section 500), Spring 2016

This homework is due on Thursday, February 11. You may cite results from class.

0. (*This problem is not to be turned in.*)

(a) Read Sections 1.5–1.7, 2.1–2.3, and 2.5–2.6

(b) Section 1.8 #19, 22

(c) Section 2.12 #1–3

1. On Homework 2, you determined the limiting behavior of solutions to the difference equation

$$x_{t+1} = ax_t + b .$$

Now, assume that $a, b \neq 0$. Find all steady states, and determine whether each of them is *locally stable*, *locally attracting*, *locally asymptotically stable*, *globally asymptotically stable*, and/or a *global attractor*. (How) does your answer depend on a and b ?

2. Section 1.8 #14, 17, 25

3. Section 2.12 #5, 6, 14

4. (In this part of your homework, you will start planning your final project.)

(a) Who will be your partner for the final project? Or, you may do a solo project.

(b) Together with your partner, pick 3 mathematical biology papers (for instance, from the list on the class Piazza site) that you might like to analyze for your project. State the titles and authors. *In class on Thursday, Feb. 11, please bring a laptop with these papers downloaded, or printed versions of the PDFs. You will pick a paper in class that day, with guidance from the instructor.*