

Assignment #1

Due Friday 7 September, 2012 at the start of class

Lightly read the introductory Chapter 1 in the textbook *Numerical Methods: Design, Analysis, and Computer Implementation of Algorithms* by Greenbaum and Chartier. This Chapter is about difficult, “big”, real problems for which computers are used to do mathematical tasks. We will only approach smaller problems in this class, but it is nice to have some substantial goals.

Now read in detail, and input every line in, Chapter 2. You will need to find or purchase a copy of MATLAB. Make sure you can create a new m-file, save it, edit it, and run it at the MATLAB command line by typing its name.

The main purpose of this assignment is to familiarize you with MATLAB, the tool we will use all the time. Do the following exercises:

Exercise 5 on page 17.

Exercise 2 on page 32.

Exercise 3 on page 32. (*Make sure to show me the MATLAB commands that generate it.*)

Exercise 4 on page 32. (*The table should be neat, have three columns, and take about 14 lines only. Obviously, you should show me the MATLAB commands that generate it.*)

Exercise 5 on pages 33–34.

Exercise 7 on page 34. (*Use the `axis` command to zoom in.*)

Exercise 9 on page 35.

Exercise 2 on pages 15–16. Do parts (a) and (b). I will not grade any of your answers to the questions in the last paragraph starting with “Can you think of other . . .”; these questions are a bit too vague for grading. But do add a part (c) which I will grade:

(c) Let $P_1 = p(1), \dots, P_4 = p(4)$. Set up, and show me clearly and neatly, a linear system of four equations in the four unknowns P_1, P_2, P_3, P_4 . Solve it by hand. Solve it with MATLAB.

Extra Credit. I can do **exercise 3 on page 32** (above) in only 48 characters. Can you do it in less than 80?