Mini Project 2: *SIR* using Sage, Due Tuesday, February 19

Your assignment is to complete the following exercises on pages 25–27, in Section 1.3, of our text:

> **Part 5: SIR using Euler's method and Sage (Exercises 23–28)**

As usual, **please follow the guidelines – especially, the "Special instructions for Mini Projects and the Term Project" – described under the "Homework Assignment Guidelines" link on our web page.** Also, **MAKE SURE you read the "Notes" below.** These notes contain some **HINTS** on the assignment, as well as some **INSTRUCTIONS** on exactly what you need to hand in.

Notes:

1. For this assignment you'll need to download, from the link that says "The Sage Page" on our course page, the program SIR.sws. You'll then need to upload it to your own Sage account. If you've forgotten how to do this, ask someone (your instructor, LA, TA, or someone in the group with whom you're working on this mini project).

2. In various of these exercises, you will be asked to print out, and turn in, some graphical output. You *need not* print in color. You certainly can if you would like, but black and white graphs are perfectly acceptable.

   The easiest way to make copies of your Sage graphs, for printing or saving to a file, is to simply take screenshots. However, if you want, you can also save Sage graphs to PDF files. You did this in tutorial: see Exercise 1(b)(c) from the tutorial of Thursday, January 25.

3. **Exercise 23.** Part (a): You *do not* need to turn in the graph you get for this part of the exercise. Part (f): you may want to refer back to Exercise 2 from the tutorial of Thursday, September 6. (See the class notes for Week 2, on our web page.)

4. **Exercise 24.** Please *do* print out and attach a copy of the graph you get when you run the program here (after you've changed the stepsize, as described in this exercise).

5. **Exercise 25.** Please *do* print out and attach a copy of the graph you get when you run the program here (after you've changed the recovery coefficient b, as described in this exercise).

6. **Exercise 26.** Please *do* print out and attach a copy of the graph you get when you run the program here (after you've changed the recovery coefficient b *back* to what it was, and replaced the transmission coefficient a with the new, smaller one, as described in this exercise).

7. **Exercise 27.** Part (a): if you're not sure what changes you need to make to reflect the requested change (to this situation where recovered can become susceptible again), you may want to see the solutions to Exercise 3(a) of the tutorial of Friday, February 1 (under the "Week 3" notes from our course page).

   Also, for this exercise, please *do* print out and attach a copy of the graph you get (after you've modified the code to reflect the requested changes, and have run the new code to generate the new graph).

8. **Exercise 28.** For this exercise, please *do* print out and attach a copy of the graph you get (after you've modified the code to reflect the requested changes, and have run the new code to generate the new graph).