Individual Homework #2: Due in class Friday, January 25

Again: for this and all homework assignments, please adhere to "Homework Assignment Guidelines" link under the "General Information" header of our course page. Also, **MAKE SURE** you read, and follow, the **"Notes/instructions"** below.

Assignment: Please read Section 1.4 in the text, and do, and hand in, the following exercises from Section 1.4.

Part 1: Functions: evaluation, composition, domain (pages 37–38): Exercises 1, 2abefg.

Part 2: Graphing functions using software (like Sage) (pages 38–41): Exercises 5, 8, 9efghi, 12.

Notes/instructions:

1. AGAIN: When you are assigned any exercises from a *part* of an exercise set (for example, **Part 1: Functions: evaluation, composition, domain**), make sure to read *carefully* all the information that appears at the beginning of that "part."

2. In this and future assignments, when asked to graph functions, please do so using *Sage.* You will have learned how to do this in class. In particular, please review both tutorials from Week 2 of classes (solutions are posted on our web page), if you need to recall how to graph using Sage.

   Please remember to label your axes (use the "axes_labels" command, as you did in tutorial). Also note that Sage will automatically put scales, or tick marks, on the axes for you. It might not always choose scales in the optimal way, and there are ways to tell Sage how to make these choices, but for now, what Sage comes up with on its own will be good enough.

   For any graphs that you hand in for this course, color printing is *optional.* Note, though, that even if you don't *print* in color, it might sometimes be helpful to *graph* in color, especially when you have several functions on the same graph, and you want to distinguish among them. Again, see the Week 2 tutorials for how to do this.

   You will not need to hand in *all* of the graphs that you might use in the course of completing this assignment. The notes below specify exactly what graphs need to be turned in.

3. **Exercise 5:** Turn in the graph for part (b); you don't need to turn in any other graphs.

4. **Exercise 8:** Turn in the graph that you used in part (b) to obtain four decimal place accuracy. You don't need to turn in any other graphs for this exercise. (Of course, you still need to answer all of the *questions* asked in parts (a) and (b).)

5. **Exercise 9:** Turn in the graph for part (i), with all three functions f, g, and h graphed on the same set of axes. Please *label* which function is which. (Put an "f" next to the

graph of f, and so on.) There are ways to do this directly in Sage, but feel free to simply label them by hand.

You don't need to turn in any other graphs for this exercise. (Of course, you still need to answer all of the *questions* asked in all parts of this exercise.)

For Exercise 9(f), remember that an "x-intercept" is just a point (a value of x) where the graph crosses the x axis. You can determine how far apart these intercepts are either by reading them directly off the graph (as well as you can), or by using things you know about trig functions.

6. **Exercise 12:** Turn in the graph for part (c), with all three functions graphed on the same set of axes. Please label which function is which. Again, labelling by hand is OK.

   You don't need to turn in any other graphs for this exercise. (Of course, you still need to answer all of the *questions* asked in all of this exercise.)

   Note that part (c) of this exercise asks you to estimate certain slopes. To do this, read off of the graph, as well as you can, the coordinates (x_1, y_1) and (x_2, y_2) of two points on the curve in question; your slope is then approximately $\Delta y/\Delta x = (y_2 - y_1)/(x_2 - x_1)$. Don't worry about being too precise here; just "eyeball" it as well as you can.