

MATH 245, Spring 2015

HOMEWORK 1

due 10:45AM on Monday, February 9.

Background reading: Sections 1.1 and 1.2 to page 18, Section 2.1, Section 3.1, and page 150.

- 1-1.** Read Section 1.1 from the textbook (pages 1–12); it gives six different models that describe real-life situations. Write two to three paragraphs explaining where you have experience with mathematical models in real life. (Do not use the examples from the book or from class unless you feel you have a unique perspective.)

In your discussion, be sure to explain how the real-life situation and the model differ. (You may want to address the following questions: Are there simplifying assumptions? Does the model truly describe what happens in real life or are there limits to the model's effectiveness? ...)

- 1-2.** Below are three different vague scenarios. Choose **one of the three** to focus on for this question. Next, identify a **precise problem statement** related to the scenario that you would like to study. Then, determine **eight variables** that affect your proposed problem statement. Last, of those eight variables, choose between three and five of the eight variables that are the most important, and **explain why** you think they are more important than the rest.

- The Bronx Zoo is planning to increase its profit during next year's "Boo in the Zoo" event.
- Queens College is choosing the classes it plans to offer for the Fall 2015 semester.
- New York City is planning to change the traffic light programming in your neighborhood to better serve the community.

- 1-3.** There are two Sidelight stories at the end of Section 2.1 on pages 76 and 77. For each story, write a paragraph in which you determine and justify the type of error involved in the story. After this, write a third paragraph that discusses the difference between the two errors encountered. Last, write a few sentences explaining the morals of these errors and how it relates in general to the modeling process in real-life.

- 1-4.** Read the Sidelight stories at the end of Section 3.2 on pages 165–166. Take one of the four situations presented (or one of your own!) and write a few paragraphs that explain explicitly how a model that was considered descriptively realistic at one time or in one place would not be considered descriptively realistic at present or in a different culture.

Reminder: You may not use any resources other than class material, your classmates, and your professor. In particular, no internet searches may be used to solve this problem. On the other hand, it is permitted and sometimes encouraged to consult the internet or additional resources for help in understanding the **Definition** questions or completing the **Exploration** questions.