Homework Sections 1.1.

I. Read problem #64 page 16, twice if necessary, to understand the information clearly. Note that the model we are studying was published in 1993 by the Johns Hopkins University School of Hygiene and Public Health in a journal called *Epidemiologic Review*.
   A. What do the variables x and y stand for in part (a) of problem #64? Your answer should be in a complete sentence, for example, "The variable *x* in this model stands for..., while the variable *y* in this model stands for..."
   B. When you have a linear equation, $y = mx+b$ (where *m* and *b* are known numbers), it is likely that you will either be given *x* and told to find *y*, or given *y* and told to find *x*. In part (b) of problem #64, which variable are you given and which are you asked to find? Again answer in a complete sentence (or sentences).
   C. Read Example 3 page 6.
   D. Solve problem #64. Remember we are looking for a solution, not an answer. Write your solution to part (a), using Example 3 on page 6 as a guide. Your solution need not mimic the example word-for-word, but you should include explanatory remarks and sentences, saying what you are doing in your computations. Similarly, include explanatory remarks in your solution to part (b). Since part (b) asks you a question about the time and AIDS patients, conclude your solution with a sentence that answers that question (putting units on your answer is not enough; you must say something like, "The model predicts that the number of years..."

II. Read problem #70 on page 18. Note that the data for the two given years was published in Science News in 1992.
   A. When we graph data, we plot points, one for each piece of data. Here our data points will have time (in years) in the x-coordinate, and the carbon emissions (in tons) in the y-coordinate. What two data points are given in the problem? Write them as ordered pairs (see page 2, in the paragraph beginning, "Each point...").
   B. Draw a graph showing the two points you listed in part A. Make your graph large enough to read (at least ¼ page). Label the axes of the graph (including units) and give the graph a title. The problem says that the carbon emission per unit of oil equivalent energy has declined linearly between 1855 and 1995. Plot some points on your graph showing data between 1855 and 1995 that might represent the data discussed here (i.e. declining linearly).
   C. When you graph a model, you will draw a curve or a line, as opposed to the discrete points you plot when graphing data. Parts (b) and (c) start with, "Assuming the linear function found in part (a) continues to be accurate,..." Copy your graph from part B (including the labels on the axes). Add the graph of a linear model that approximates your data (Figures 13 on page 22 shows a graph with both data and a linear model, for your reference). What would the graph of the data look like if the model did not continue to be accurate in 2020? Explain in a complete sentence, and add some data to your graph between the years of 1995 to 2020 to demonstrate.
   D. Solve problem #70. In part (a) explain your work clearly. For parts (b) and (c), and of course (d), answer in sentences.