Homework for Week 1
Sept. 24-28, 2007

The textbook exercises listed here should be completed before class begins; students will share solutions to these exercises at the beginning of class. You should be prepared to share a solution to any one of these.

Before Class on Tuesday, September 25, read Section 1.1 and work the following exercises:
Section 1.1, # 7, 9, 43
Comments: For 7 and 9, write a sentence that explains the meaning in context of the value you calculated. Note that to do problem 43, you must also complete number 42.

Before Class on Wednesday, September 26, read Section 1.2 and work the following exercises:
Section 1.2, # 35, 37, 47

Before Class on Thursday, September 27, read Section 1.3 and work the following exercises:
Section 1.3, # 3, 9, 11
Comments: For question 3, you will need to use a linear regression on your calculator to find the line of best fit. For question 11, however, you should find the equation of the linear function by hand since there are only two data points. For number 9a, you will need to use a piecewise linear function to answer the question.

Before Class on Friday, September 28, read Section 2.1 up to page 62 (stop when you finish with example 8) and work the following exercises:
Section 2.1, # 11, 19, 21
Comments: Note that to answer questions 11 and 19, you also need to do problems 1 and 9. When you solve systems algebraically for this assignment, only use substitution. We will use elimination on the next homework assignment.
Additional Practice Problems

Practice as many of these problems as you can. You may use your solutions as notes during the quiz on Tuesday, October 2.

Section 1.1, # 11, 13, 15, 21, 25, 31, 33, 35, 37, 39
Section 1.2, # 1, 3, 7, 9, 13, 15, 19, 23, 27, 31, 39
Section 1.3, # 1, 5, 7, 13, 15
Section 2.1, # 3, 5, 7, 13, 15, 17, 23, 25

Written Homework

Your carefully written solutions to the following questions will be due at the beginning of class on Friday, September 28.

1. You run a company that manufactures widgets. Your total monthly operating cost has two components: a variable cost that depends on how many widgets you manufacture (because you need to pay for supplies and for labor); and a fixed cost that you pay each month (for your lease on the manufacturing plant and salaries of the managers).
   (a) Assume that the variable cost is proportional to the number of widgets produced. If the variable cost is $25,000 to manufacture 100 widgets, what is the variable cost to manufacture $x$ widgets.
   (b) If the fixed monthly operating cost is $18,625, combine this with your answer for (a) to write down a formula for the total monthly operating cost.
   (c) What is the monthly operating cost for producing 250 widgets?

2. The table at right summarizes the U.S. average annual income for full-time workers in the years 1970 and 1987.

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>$5,616</td>
<td>$9,521</td>
</tr>
<tr>
<td>1980</td>
<td>$18,531</td>
<td>$28,313</td>
</tr>
</tbody>
</table>

Assume that these data were recorded at the beginning of the years indicated.

(a) Use the data in this table to write formulas for two linear functions: one function to model women’s average annual income as a function of the year, and one to model men’s average annual income as a function of the year. Be sure to label which function is which.

(b) Use the linear equations you found in (a) to predict when the average annual income of men and women will be equal. (You will need to solve a system of equations – do so algebraically, and check your answer graphically; include a copy of your graph with your solution.)

3. The table at right indicates the monthly rent and the floor area for some apartments in Seattle’s University District. Use a linear regression to answer the following questions.

<table>
<thead>
<tr>
<th>Square Feet</th>
<th>Rent</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>$525</td>
</tr>
<tr>
<td>550</td>
<td>$560</td>
</tr>
<tr>
<td>650</td>
<td>$750</td>
</tr>
</tbody>
</table>

(a) Find a linear model for the rent of an apartment as a function of its floor area.

(b) Use your model from (a) to estimate how large an apartment you can afford if you have $600 a month to spend on rent.