ECO 610-401 Problem Set #2 Fall 2002

Due: Beginning of class, Monday, October 7, 2002.

1. Samuelson and Marks, Problem 4.6, p. 175.

2. Samuelson and Marks, Spreadsheet Problem S3, p. 178.

3. As the newly promoted director of marketing for Canteen Food Services, you finally get the chance to evaluate something that has been bugging you ever since you refilled your first soft-drink vending machine: What factors affect the demand for soft drinks sold from vending machines on the University of Kentucky campus? You decide to undertake a demand study. You vary the price of soft drinks. You also vary the price of candy bars and potato chips sold in vending machines right beside the soft-drink machines. You also get the physical plant department to allow you to vary the temperature inside the classrooms around campus. When all the data are in, your research assistant estimates the following regression equation:

| Independent Variable: | Constant | Price | Other Price | Temperature |
|------------------------|----------|---------|-------------|-------------|
| Estimated Coefficient: | 3055 | -120.5 | 16.3 | 74.8 |
| Standard Error: | 1488 | 26.6 | 22.9 | 18.3 |
| t-statistic: | (2.05) | (-4.53) | (0.71) | (4.09) |

- a) What can you conclude from the above regression results? You should take each of the three variables and discuss whether the variable is statistically significant, whether the coefficient has the expected sign, and how to interpret the magnitude of the coefficient. The dependent variable is quantity of 12 oz. cans of soft drinks purchased in a given day. Price is measured in cents per can, other price is measured in cents per candy bar, and temperature is measured in degrees Fahrenheit. You have over a year's worth of daily observations on each variable.
- b) $R^2 = .55$ for your model. What does that mean?
- c) Yesterday the temperature in classrooms was 72 degrees, the price per can for soft drinks was 50 cents, and the price of candy bars was 60 cents. Today you have to restock the machines on campus after yesterday's sales. How many cans of soft drinks do you think you sold yesterday?
- d) On a typical day you sell 4000 cans at your usual price of 50 cents per can. Calculate ownprice elasticity of demand.
- e) Given your answer above, is 50 cents per can the profit-maximizing price? Your marginal costs are 20 cents per can.