ECO 601
Fall 2002
1st Test

Questions 1, 2, and 3: True, False, or Uncertain, and Explain (10 pts. Each):

1. In a three good world, the own-price elasticity of demand for good X is -2.0. The cross-price elasticities between goods X and Y and between goods X and Z are 0.4 and 0.8, respectively. On the basis of this information, we would classify good X as a necessity.

2. In France bread costs 3f per loaf and wine costs 4f per liter bottle. Per capita consumption is 4 loaves of bread and 12 bottles of wine per week. In Switzerland the price of bread is 4k and the price of wine is 3k. Weekly per capita consumption in Switzerland is 12 loaves of bread and 4 bottles of wine. The French and the Swiss definitely have different tastes.

3. Peter Parker earns $20 per hour, works his desired amount of 2000 hours per year, and so has a $40,000 annual income. If Peter's wage falls to $10 per hour but he wins the lottery that pays him $20,000 annually, his hours of work and income are expected to remain the same.

4. (10 pts.) Billy Bob has a utility function of the Cobb-Douglas form: $U(X, Y) = X^{\alpha}Y^{\beta}$. As you are probably aware, Billy Bob's demand for good X is of the form: $X = \alpha I/P_x$. Calculate Billy Bob's income elasticity of demand for good X.

5. (35 pts.) An individual consumes two goods, X and Y, whose prices are denoted by P_x and P_y.
    a) Write the Slutsky equation for a change in the price of good Y on the quantity demanded of good X.
    b) The individual initially has income of $100, and $P_x = P_y = \$10$. Under these circumstances the individual chooses to consume 3 units of good X. Illustrate these conditions in the attached diagram.
    c) Now the price of Y rises to $20 per unit. If X is an inferior good, will consumption of X rise or fall? Use the Slutsky equation to briefly explain your answer.
    d) Illustrate the effect of this change in P_y in your diagram. Carefully show the income and substitution effects.
    e) Also in the attached diagram, illustrate the Marshallian and Hicksian demand curves for good Y.

6. (25 pts.) Fortunately for us, Roxane consumes only two goods, which we will call X and Y. Roxane gets utility according to: $U(X, Y) = -X^{-1} - Y^{-1}$.
    a) Write the expression for the marginal utility Roxane gets from consumption of X. Is it diminishing?
    b) Use the Lagrangian multiplier method to derive Roxane's Marshallian demand functions for X and for Y.
    c) Take the demand function for good X and show that if I, P_x, and P_y all change by a factor of t, then Roxane's demand for X will remain unchanged.