

ECO 601  
Fall 2003  
Problem Set #5

Due: Wednesday, October 8

1. Noah Fect has the following utility function for beer (B) and soft drinks (S):  
$$U = S + \ln(B).$$
  - a) Find Noah's uncompensated demand function for beer.
  - b) Suppose Noah has \$6 to spend on beer and soft drinks and  $P_B = \$1$  and  $P_S = \$2$ . How much of each will he buy? Suppose he has \$8 to spend. How much of each will he buy?
  - c) Draw Noah's uncompensated demand curve for beer, assuming that  $P_S = \$2$  and that he spends \$5 on these two items.
  - d) Now draw Noah's compensated demand curve for beer.
2. If Sophie had more income she would drink less beer and more wine. While she views beer and wine as net substitutes, when the price of beer goes up she buys less wine. On the other hand, if the price of wine goes up, she buys more beer. Show how this can happen in a diagram with beer on the horizontal axis and wine on the vertical axis.
3. Once DeLeon and his brother Twice live on the island of Yewth. The only foods they consume are mangos, M, and coconuts, C, which they buy from a vendor who makes a weekly trip to their island. Once and Twice have the same individual demand functions for M:  $M = (P_C I) / (2P_M^2)$ . Their incomes come in the form of weekly checks from the government of a large nearby country.
  - a) Suppose that  $P_C = \$1$ , Once has  $I = \$10$ , and Twice has  $I = \$20$ . Sketch Once's and Twice's individual demand curves for mangos, and then sketch the market demand curve.
  - b) Write the equation for the market demand curve, and confirm that it matches your graph.
  - c) Calculate the own-price elasticity, income elasticity, and cross-price elasticity of demand for mangos.
4. TFUE: In 2001 I bought a bundle of goods that would have cost me more in 2000 than my 2000 income. Therefore I must be better off in 2001 than I was in 2000.
5. TFUE: Goods with a large budget share have a greater price elasticity if they are inferior goods.
6. TFUE: 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 X and Z are 0.4 and 0.8, respectively. On the basis of this information we would classify Good X as a necessity.