Economics 100A: Microeconomic Analysis
Fall 2001

Problem Set 4
(Due the week of September 24)

1. Define an inferior, normal, luxury and necessity good. Can a good be both inferior and normal? How?

2. The tables below report total current consumption expenditures and expenditures on certain major categories of goods for 5 different income groups in the United States in 1961. People within each of these groups all had similar incomes. Group A is the lowest income group and Group E in the highest.

Table 1. Expenditure by Category for Various Income Groups, 1961

	Income Groups				
	A	B	C	D	E
Food Prepared at Home	465	783	1078	1382	1848
Food Away from Home	68	171	213	384	872
Housing	626	1090	1508	2043	4205
Clothing	119	328	508	830	1745
Transportation	139	519	826	1222	2048
Other	364	745	1039	1554	3490
Total Expenditures	1781	3636	5172	7415	14208

Table 2. Percentage Allocation of Family Budget

	Income Groups				
	A	B	C	D	E
Food Prepared at Home	26.1	21.5	20.8	18.6	13.0
Food Away from Home	3.8	4.7	4.1	5.2	6.1
Housing	35.1	30.0	29.2		
Clothing	6.7	9.0			
Transportation	7.8	14.3			

(a) Complete Table 2.
(b) Which of these goods are normal goods?
(c) Which of these goods are luxury goods at most income levels?
(d) Which of these good are necessity goods at most income levels?
(e) Draw the Engel curve for one of the luxury goods mentioned in part (c).
(f) Draw the Engle curve for one of the necessity goods mentioned in (d).
(g) How does the shape of an Engel curve for a luxury differ from the shape of an Engel curve for a necessity?

(Hint: In drawing the Engel curves, use total expenditure on current consumption as income.)

3. A person's utility function is of the form $U(x,y) = 5xy$. The prices of good x and y are $p_x = \$4$ and $p_y = \$2$, respectively. The person's income is $1200.

    (a) Show that these preferences are homothetic?
    (b) What quantities of x and y should the consumer purchase to maximize his utility?
    (c) Determine the person's income offer curve (IOC). Draw it.
    (d) Explain whether each of the two goods is normal or inferior.
    (e) Derive the Engel curve for x. Draw it.

4. Neville's passion is fine wine. When the prices of all other goods are fixed at current levels, Neville's demand function for high-quality claret is $q = .02m - 2p$, where m is his income, p is the price of claret (in British pounds), and q is the number of bottles of claret that he demands. Neville's income is 7500 pounds, and the price of a bottle of suitable claret is 30 pounds.

    (a) How many bottles of claret will Neville buy?
    (b) If the price of claret rose to 40 pounds, how much income would Neville have to have in order to be exactly able to afford the amount of claret and the amount of other goods that he bought before the price change?
    (c) At the income level you mentioned in part (b) and the higher price of claret of 40 pounds, how many bottles would Neville buy?
    (d) At the original income of 7500 pounds and a price of 40, how much claret would Neville demand?
    (e) Decompose the total price effect into the substitution and income effect.

5. Suppose that preferences are not convex. Is it still the case that the substitution effect is negative?