ECO 300.Intermediate Microeconomics

Homework 1

1. Consider a demand of the form $Q_D = -2P + 16$ and a supply curve of the form $Q_s = P - 5$. Plot these curves and be sure to P on the vertical and Q on the horizontal axis. Find the equilibrium price and quantity.

2. Consider the function $Y = \sqrt{XZ}$ where $X > 0$ and $Z > 0$. Draw the contour lines (in the positive quadrant) for this function for $Y = 4$, $Y = 5$, and $Y = 10$. What do we call the shape of these contour lines? Where does the line $20X + 10Z = 200$ intersect with the contour line $Y = 50$?

3. Suppose Mary enjoys Pepsi and Coke according to the function $U(P, C) = 4C + 5P$. What does her utility function say about her MRS of Coke for Pepsi? What do her indifference curves look like? What type of goods are Pepsi and Coke for Mary? If Pepsi and Coke each cost \$1 and Mary has \$20 to spend on these products, how many units of each product should she buy in order to maximize her utility? Show this utility maximizing combination combination of Pepsi and Coke on the graph. how would her consumption and utility maximizing bundle of Coke and Pepsi change if the price of Coke decreases to 50 cents.

4. Suppose a person has \$8 to spend only on apples and bananas. Apples

cost $0.4 each, and bananas cost $0.1 each. Furthermore, his preferences for

apples (A) and bananas (B) can be represented by $U = \sqrt{AB}$.

a) If $A = 5$ and $B = 80$, what will utility be?

b) If $A = 10$, what value of for B will provide the same utility in part a?

c) If $A = 20$, what value of for B will provide the same utility in parts

a and b?

d) Graph the indifference curve implied by parts a through c.

e) Give the budget constraint, which of the points identified in parts a

through c can be bought by this person?

f) show through some examples that every other way of allocating income

provides less utility than does the point identified in part b. graph this utility

maximizing situation.

5. Vera is an impoverished graduate student who has only $100 a month

to spend on food. She has read in a government publication that she can

assure an adequate diet by eating only peanut butter and carrots in the fixed

ratio of 2 pounds of peanut butter to 1 pound of carrots, so she decides to

limit her diet to that regime.

a) If peanut butter costs $4 per pound and carrots cost $2 per pound,

how much can she eat during the month?

b) Suppose peanut butter costs rise to $5 because of peanut subsidies

introduced by a politically sensitive government. By how much will Vera have to reduce her food purchases?

c) How much in food stamp aid would the government have to give Vera to compensate for the effects of peanut subsidy?

d) Explain why Vera's preferences are of a very special type here. How would you graph them?