

Assignment #1Due Friday 9/15/06 by 6 p.m. in the Econ 301-1 slot in the Economics Alcove

Please show the calculations used to arrive at your answers. Draw graphs neatly and label axes and points clearly. In general, leave numbers in fractional form while solving problems. Round final answers to the first decimal place if necessary.

- A. Suppose there are 8 people who want to rent an apartment. Their reservation prices are given below (to keep the numbers small, think of these as daily rent payments):

Person:	A	B	C	D	E	F	G	H
Price:	40	25	30	35	10	18	15	5

Note that for this problem you are working with the true demand curve constructed from the reservation prices of the consumers rather than the smoothed demand curve used in the text.

- (1)
 - a. Draw the market demand curve [Hint: when the market price is equal to a consumer's reservation price there will be two different quantities of apartments demanded, since the consumer will be indifferent between having or not having an apartment].
 - b. Suppose the supply of apartments is fixed at 5 units. In this case there is a whole range of prices that will be equilibrium prices. What is the highest price that would make the demand for apartments = 5? What is the lowest price that would make demand = 5?
 - c. If the supply of apartments = 4, which of the people A-H end up getting apartments?
 - d. If the supply of apartments increases to 6 units, what is the range of equilibrium prices?
- (2) Suppose that there are originally 5 units in the market and that 1 of them is turned into a condominium. Suppose person A decides to buy the condominium. What will be the highest price at which the demand for apartments will equal the supply of apartments? What will be the lowest price?
- (3) Suppose now that a monopolist owns all 5 apartments and that he is trying to determine which price-quantity combination maximizes his revenues.
 - a. What price would the monopolist charge? Which of the people would get apartments?
 - b. If the monopolist were required by law to rent exactly 5 apartments, what price would he charge to maximize his revenue? Which of the people would get apartments?
 - c. If the landlord could charge each individual a different price, and he knew the reservation prices of all the individuals, what is the maximum revenue he could make if he rented all 5 apartments? Who would get them?
- (4) Suppose there are 5 apartments to be rented and that the city rent-control board sets a maximum rent of \$9. Suppose A-E manage to get apartments, while F-H do not.
 - a. If subletting is legal (or at least, practiced), who will sublet to whom in equilibrium?
 - b. What will be the maximum amount that can be charged for the sublet payment?
 - c. With unlimited subletting, which of the consumers will end up in the 5 apartments?
 - d. How does this compare to the free market outcome in (1)b.?

- B. Suppose you have an income of \$40 to spend on two commodities. Commodity X costs \$10 per unit and commodity Y costs \$5 per unit.
- (1) Write down your budget constraint. If you spent all your income on X, how much could you buy? If you spent all your income on Y, how much could you buy? Graph your budget constraint. What is its slope?
 - (2) Suppose the price of X falls to \$5 while everything else stays the same. Write down your new budget constraint. What is its slope? Graph your new budget constraint on the same graph as (1) (using a different color).
 - (3) Suppose your income falls to \$30, but the prices of X and Y remain at \$5. Write down your new budget constraint. What is its slope? Graph your new budget constraint on the same graph as (1) and (2) (using yet another color).
 - (4) On your graph, use one color to shade in the area representing commodity bundles that you can afford with the budget in (3) but could not afford to buy with (1). Use another color to shade in the area representing commodity bundles that you could afford with the budget in (1) but cannot afford with the budget in (3).
- C. For each case of preferences below, draw three indifference curves and label them U_1 , U_2 , U_3 to show increasing levels of utility.
- (1) Sheila Sixpack drinks beer every night while watching ESPN. She doesn't care what size of can her beer comes in, only about how much beer she has. Show her indifference curves between 16-ounce cans and 8-ounce cans of beer.
 - (2) Quincy Quiche likes to have a beer every night while watching FoodChannel. He only allows himself an 8-ounce glass of beer per evening so if there are more than 8 ounces in a can he pours the rest down the sink (and has no moral scruples about wasting beer). Show his indifference curves between 16-ounce cans and 8-ounce cans of beer.
 - (3) Give an example of two commodity bundles such that Sheila likes the first bundle better than the second bundle, while Quincy likes the second bundle better than the first bundle.
 - (4) Spike finds himself alone in front of a soft drink machine in the middle of the Mojave desert on a hot afternoon. The machine requires exact change: two quarters and a dime. No other combination of coins will make anything else come out of the machine. Spike is so thirsty that the only thing he cares about is how many soft drinks he can buy: the more, the better. Show his indifference curves between quarters and dimes.
- D. (1) Write down a utility function that represents Sheila's preferences in C.(1), where X stands for the number of 8-ounce cans of beer and Y stands for the number of 16-ounce cans. What is her MRS?
- (2) Write down a utility function that represents Quincy's preferences in C.(2), where X stands for the number of 8-ounce cans of beer and Y stands for the number of 16-ounce cans. What is his MRS?
- (3) Ambrose has the utility function $U(X,Y) = 4\sqrt{X} + Y$. What is the (algebraic) formula for his MRS? What is his MRS when he is consuming the bundle (9,10)?
- (4) a. Joe has a utility function given by $U(X,Y) = X^2 + 2XY + Y^2$. What is the formula for his MRS?
- b. Bob has a utility function given by $V(X,Y) = X + Y$. What is the formula for his MRS?
- c. Do $U(X,Y)$ and $V(X,Y)$ represent the same preferences? Explain.
- d. Show that Joe's utility function is a monotonic transformation of Bob's.