THE UNIVERSITY OF THE WEST INDIES

**ST. AUGUSTINE**

**FACULTY OF SOCIAL SCIENCES**

# DEPARTMENT OF ECONOMICS

# ECON2000: INTERMEDIATE MICROECONOMICS I – 2012/13

# TUTORIAL SHEET 1

### THE THEORY OF CONSUMER BEHAVIOUR

**PROBLEMS**

1. The following data represent 5 points on the supply curve for orange juice:

PRICE ($ PER GALLON) QUANTITY (MILLIONS OF GALLONS)

1 100

2 300

3 500

4 700

5 900

and these data represent 5 points on the demand curve for orange juice:

PRICE ($ PER GALLON) QUANTITY (MILLIONS OF GALLONS)

1 700

2 600

3 500

4 400

5 300

a. Graph the points of these supply and demand curves for orange juice. Be sure to put price on the vertical axis and quantity on the horizontal axis.

b. Do these points seem to lie along two straight lines? If so, figure out the precise algebraic equation of these lines. (Hint: If the points do lie on straight lines, you need only consider two points on each of them to calculate the lines.)

c. Use your solutions from part b to calculate the ‘‘excess demand’’ for orange juice if the market price is zero.

d. Use your solutions from part b to calculate the ‘‘excess supply’’ of orange juice if the orange juice price is $6 per gallon.

2 Marshall defined an equilibrium price as one at which the quantity demanded equals the quantity supplied.

a. Using the data provided in problem 1.1, show that P = 3 is the equilibrium price in the orange juice market.

b. Using these data, explain why P = 2 and P = 4 are not equilibrium prices.

c. Graph your results and show that the supply demand equilibrium resembles that shown in Figure 1.3.

d. Suppose the demand for orange juice were to increase so that people want to buy 300 million more gallons at every price. How would that change the data in problem 1.1?

 How would it shift the demand curve you drew in part c?

e. What is the new equilibrium price in the orange juice market, given this increase in demand? Show this new equilibrium in your supply demand graph.

f. Suppose now that a freeze in Florida reduces orange juice supply by 300 million gallons at every price listed in problem 1.1. How would this shift in supply affect the data in problem 1.1? How would it affect the algebraic supply curve calculated in that problem?

g. Given this new supply relationship together with the demand relationship shown in problem 1, what is the equilibrium price in this market?

h. Explain why P = 3 is no longer an equilibrium in the orange juice market. How would the participants in this market know P = 3 is no longer an equilibrium?

1. Graph your results for this supply shift.

3. Suppose a person has $8.00 to spend only on apples and bananas. Apples cost $.40 each, and bananas cost $.10 each.

a. If this person buys only apples, how many can be bought?

b. If this person buys only bananas, how many can be bought?

c. If the person were to buy 10 apples, how many bananas could be bought with the funds leftover?

d. If the person consumes one less apple (that is, nine), how many more bananas could be bought? Is this rate of trade-off the same no matter how many apples are relinquished?

e. Write down the algebraic equation for this person’s budget constraint, and graph it showing the points mentioned in parts a through d (using graph paper might improve the accuracy of your work).

4. Suppose the person faced with the budget constraint described in problem 2.1 has preferences for apples (A) and bananas (B) given by

 Utility = $\sqrt{A .B}$

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

b. If A =10, what value for B will provide the same utility as in part a?

c. If A = 20, what value for B will provide the same utility as in parts a and b?

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

e. Given the budget constraint from problem 2.1, 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. Elizabeth M. Suburbs makes $200 a week at her summer job and spends her entire weekly income on new running shoes and designer jeans, because these are the only two items that provide utility to her. Furthermore, Elizabeth insists that for every pair of jeans she buys, she must also buy a pair of shoes (without the shoes, the new jeans are worthless). Therefore, she buys the same number of pairs of shoes and jeans in any given week.

a. If jeans cost $20 and shoes cost $20, how many will Elizabeth buy of each?

b. Suppose that the price of jeans rises to $30 a pair. How many shoes and jeans will she buy?

c. Show your results by graphing the budget constraints from part a and part b. Also draw Elizabeth’s indifference curves.

d. To what effect (income or substitution) do you attribute the change in utility levels between part a and part b?

e. Now we look at Elizabeth’s demand curve for jeans. First, calculate how many pairs of jeans she will choose to buy if jeans prices are $30, $20, $10, or $5.

f. Use the information from part e to graph Ms. Suburbs’s demand curve for jeans.

g. Suppose that her income rises to $300. Graph her demand curve for jeans in this new situation.

h. Suppose that the price of running shoes rises to $30 per pair. How will this affect the demand curves drawn in part b and part c?

6. Suppose that the demand curve for garbanzo beans is given by

 Q = 20 – P

Where: Q is thousands of pounds of beans bought per week and

 P is the price in dollars per pound.

a. How many beans will be bought at P = 0?

b. At what price does the quantity demanded of beans become 0?

c. Calculate total expenditures (P Æ Q) for beans of each whole dollar price between the prices identified in part a and part b.

d. What price for beans yields the highest total expenditures?

e. Suppose the demand for beans shifted to Q ¼ 40 - 2P. How would your answers to part a through part d change? Explain the differences intuitively and with a graph.

7. Suppose a person must accept one of three bets:

 Bet 1: Win $100 with probability 1/2; lose $100 with probability 1/2.

 Bet 2: Win $100 with probability 3/4; lose $300 with probability 1/4.

 Bet 3: Win $100 with probability 9/10; lose $900 with probability 1/10.

a. Show that all of these are fair bets.

b. Graph each bet on a utility of income curve similar to Figure 4.1.

c. Explain carefully which bet will be preferred and why.

8. Two fast-food restaurants are located next to each other and offer different procedures for ordering food. The first offers five lines leading to a server, whereas the second has a single line leading to five servers, with the next person in the line going to the first available server. Use the assumption that most individuals are risk averse to discuss which restaurant will be preferred.

9. Consider a simultaneous game in which player A chooses one of two actions (Up or Down), and B chooses one of two actions (Left or Right). The game has the following payoff matrix, where the first payoff in each entry is for A and the second for B.

|  |  |  |
| --- | --- | --- |
|  |  | **B** |
|  |  | **Up** | **Down** |
| **A** | **Up** | 3,3 | 5,1 |
| **Down** | 2,2 | 4,4 |

a. Find the Nash equilibrium or equilibria.

b. Which player, if any, has a dominant strategy?

10. Two classmates A and B are assigned an extra-credit group project. Each student can choose to Shirk or Work. If one or more players chooses Work, the project is completed and provides each with extra credit valued at 4 payoff units each. The cost of completing the project is that 6 total units of effort (measured in payoff units) is divided equally among all players who choose to Work and this is subtracted from their payoff. If both Shirk, they do not have to expend any effort but the project is not completed, giving each a payoff of 0. The teacher can only tell whether the project is completed and not which students contributed to it.

a. Write down the normal form for this game, assuming students choose to Shirk or Work simultaneously.

b. Find the Nash equilibrium or equilibria.

c. Does either player have a dominant strategy? What game from the chapter does this resemble?

**THEORY QUESTIONS**

1. ‘‘A shift outward in the demand curve always results in an increase in total spending (price times quantity) on a good. On the other hand, a shift outward in the supply curve may increase or decrease total spending.’’ Explain.

2. Two students studying microeconomics are trying to understand why the tangent condition studied in this chapter means utility is at a maximum. Let’s listen:

 Student A. If a person chooses a point on his or her budget constraint that is not tangent, it is clear that he or she can manage to get a higher utility by spending differently.

 Student B. I don’t get it—how do you know he or she can do better instead of worse?

 How can you help out Student B with a graph?

3. When there are only two goods, the assumption of a diminishing MRS requires that substitution effects have price and quantity move in opposite directions for any good. Explain why this is so. Do you think the result holds when there are more than two goods?

4. Explain whether the following events would result in a move along an individual’s demand curve for popcorn or in a shift of the curve.

 If the curve would shift, in what direction?

 a. An increase in the individual’s income

 b. A decline in popcorn prices

 c. An increase in prices for pretzels

 d. A reduction in the amount of butter included in a box of popcorn

 e. The presence of long waiting lines to buy popcorn

 f. A sales tax on all popcorn purchases

5. What does it mean to say we expect a fair coin to come up heads about half the time? Would you expect the fraction of heads to get closer to exactly 0.5 as more coins are flipped? Explain how this law of large numbers applies to the risks faced by casinos or insurance companies.

6. Why does the assumption of diminishing marginal utility of income imply risk aversion? Can you think of other assumptions that would result in risk-averse behavior (such as the purchase of insurance) but would not require the difficult-to verify notion of Diminishing marginal utility?

7. What is the difference between an action and a strategy?

8. Why is the Prisoners’ Dilemma a ‘‘dilemma’’ for the players involved?

 How might they solve this dilemma through pregame discussions or postgame threats? If you were arrested and the D.A. tried this ploy, what would you do? Would it

 matter whether you were very close friends with your criminal accomplice?

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