THE UNIVERSITY OF ZAMBIA
SCHOOL OF HUMANITIES AND SOCIAL SCIENCES
ECONOMICS DEPARTMENT
ECN 2115 TUTORIAL SHEET 1

1. You are given a firm that wishes to maximize profits (∏). The total revenue function of the firm is; $R= 4000Q – 33 Q^2$. The total cost function is $C=2Q^3 – 3Q^2 + 400Q +5000$. Find the optimum quantity that maximises profits.

2. We have three goods X_1, X_2 and X_3. We have in the market place, the price of $P_1 = K10$, the price of good X_1;$P_2 = K2$, the price of good X_2 ; and $P_3 = K4$, the price of good X_3 .

The consumer has $K100$ to spend on these items. The consumer must spread the expenditure of these three items such as to maximize utility. We are given the consumer's utility function as follows: $U = U(X_1, X_2, X_3) = 5 \log X_1 + 3 \log X_2 + 2 \log X_3$.

a) Derive the consumer's budget constraint. b) Solve for the optimal bundle (X1, X2, X 3)

3. You are given an objective function f (X, Y) = $4 X^2 + 3XY + 6 Y^2$ and the constraint on the function in the form of X + Y = 56. Optimize f (X, Y) subject to the constraint.

4. Suppose the market demand curve for a product is given by Qd =1000 −10P and the

a) market supply curve is given by Qs = −50 + 25P.

b) a. What are the equilibrium price and quantity?

c) b. What is the Inverse Form of the demand curve?

d) c. At the market equilibrium, what is the price elasticity of demand?

e) d. Suppose the price in this market is $25. What is the amount of excess demand?

5. Suppose demand for good A is given by $Q_A^d = 500 - 10P_A + 2P_B + 0.70I$ where P_A is the price of good A, P_B is the price of some other good B, and I is income. Assume that P_A is currently \$10, P_B is currently \$5, and I is currently \$100.

a. What is the elasticity of demand for good A with respect to the price of good A at the current situation?

b. What is the cross-price elasticity of the demand for good A with respect to the price of good B at the current situation?

c. What is the income elasticity of demand for good A at the current situation?

5. Consider the utility function $U(x, y) = 3x^2 + 5y$ with $MUx = 6x$ and $MUy = 5$.

a. Is the assumption that "more is better" satisfied for both goods?

b. What is the MRSx,y for this utility function?

c. Is the MRSx,y diminishing, constant, or increasing as the consumer substitutes x for y along an indifference curve?

d) Will the indifference curves corresponding to this utility function be convex, concave, or straight lines?

Explain.

6. Consider two goods, A and B. For each of the following scenarios, develop the utility function U(A, B) that matches the given information.

a. The consumer believes that good A and B are perfect substitutes with one unit of A equivalent to four units of B.

b. The consumer believes that good A and B are perfect compliments and always uses three unites of B for every unit of A.

7. Linda consumes two goods, X and Y. Her utility function is U = XY. Initially, P_x = \$18 and P_y= \$2. Linda's income is \$288. Then the price of X falls to \$8. [The following questions ask you to calculate a mathematical example of the income and substitution effects of a price decrease for good X.]

a) Complete the following table.

Basket	X	Y	$U = XY$	$\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$	Expenditure $P_X X + P_Y Y$
A					
B	12	48			
C					

b) The movement from point A to point B illustrates which effect, the income effect or the substitution effect? Explain.

c) The movement from point B to point C illustrates which effect, the income effect or the substitution effect? Explain.

d) Is good X a normal, inferior, or Giffen good? Explain.