

PRINCIPLES OF MICROECONOMICS (ECON 1101 SECTION 056)
ASSIGNMENT #2

Due Monday, 29 Sep 2008, 5:00 pm. Assignments should be typed and submitted in hardcopy. Graphs and calculations may be handwritten but must be neat and professional. Students are welcome to discuss homework in groups, but each student must prepare and submit a unique assignment and note the names of other group members. Answer all parts of all questions.

1. (12 points) The price of a capacitor increases from 70¢ each to 80¢ each while preferences remain the same. Use the data from the table to answer the questions or complete the tasks in (a)-(d).

Price of capacitors	Quantity of capacitors demanded	Quantity of thyristors demanded
70	31,500	5,000
80	28,500	4,600

- (a) Calculate the price elasticity of demand for capacitors.
- (b) Is the demand for capacitors elastic, unit-elastic, or inelastic in this price range?
- (c) Calculate the cross price elasticity between capacitors and thyristors.
- (d) Are these goods complements, substitutes, or not related? Why?
2. (20 points) The demand in the market for ceiling fans is described by $P(Q) = 200 - 2Q$.
- (a) Find the quantity demanded as a function of price. (That is, rewrite $P(Q)=200-2Q$ as $Q(P)=...$)
- (b) Complete the table. Calculate elasticities using the midpoint rule.

Quantity demanded	Price	Price elasticity on the interval
0		
20		
40		
60		
80		
100		

3. (12 points) Marie spends all her money on two goods: bread (b) and cake (c). The price of bread is 2, the price of cake is 5, and Marie receives a daily income of 17. Marie has a utility function given by $U(b,c) = b \cdot c + 4c$.
- (a) Graph Marie's budget line. Label everything and give numerical values for the intercepts.
- (b) For each of the following consumption bundles indicate whether or not Marie can afford it. Then rank the affordable bundles according to Marie's preferences.
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|----------|----------|----------|
| b=0, c=3 | b=2, c=3 | b=5, c=1 |
| b=1, c=4 | b=3, c=2 | b=6, c=1 |
| b=2, c=2 | b=4, c=2 | b=9, c=0 |

4. (12 points) A consumer buys 17 kg/yr of rice when income is \$40,000 and the price of rice is \$1.30/kg. When the consumer's income rises to \$45,000, the consumer buys 15 kg/yr.
- (a) Is rice a normal or inferior good? Why?
- (b) Calculate the income elasticity of demand for rice.

5. (8 points) Suppose there are two goods, X and Y, where X is inferior and Y is normal. Suppose the price of X increases. Draw a graph in X-Y space and mark the optimal consumption bundles from before and after the price change. Graphically show the income and substitution effects, being clear to label each effect.

6. (24 points) A firm sells in a perfectly competitive market. The market price for the good is 4 per unit.
- (a) Complete the following table:

Quantity	Fixed Cost	Variable Cost	Total Cost	Average Variable Cost	Average Total Cost	Marginal Cost	Profit
0	4			---	---	---	
1			6				
2		5					
3				3			
4						6	
5					5.4		
6			36			9	

- (b) Use the profit column to find the profit maximizing quantity.
- (c) Graph the firm's supply curve.
7. (12 points) A firm faces costs given by the total cost function $TC(Q) = Q^2 + 4$. The industry is perfectly competitive, and the market price is 18.
- (a) Graph the cost function.
- (b) What is the fixed cost faced by this firm?
- (c) Does the production function, which this cost curve represents, exhibit diminishing marginal product of its inputs? Explain why or why not.
- (d) Find the firm's total revenue as a function of Q.
- (e) Find the firm's profit as a function of Q.