

ECONOMICS 1101 §56 – FALL 2008
MIDTERM #1
Answer Key

INSTRUCTIONS: Write your name on the back of the exam. Answer all parts of all questions. Show work on questions 11-16. Exactly 75 minutes will be provided to complete the exam. Notes, books, computers, cell phone, or communications devices may not be used. Calculators may be used. Communication with other students is not permitted. The test has 7 pages and 140 possible points.

Questions 1 – 10 are worth 5 points each. Select the choice that answers the question or best completes the statement.

B 1. If the cross elasticity of demand for goods A and B is a negative value, then
(a) goods A and B are substitutes.
(b) goods A and B are complements.
(c) goods A and B are both normal.
(d) at least one of goods A and B is inferior.

B 2. Globally, oil is a normal good. Suppose that an especially active hurricane season increases production costs for oil, and that a worldwide economic recovery increases incomes. Which of the following should one expect?
(a) Demand to increase, supply to increase, and quantity exchanged to increase
(b) Demand to increase, supply to decrease, and price to increase
(c) Demand to decrease, supply to increase, and price to decrease
(d) Demand to decrease, supply to decrease, and quantity exchanged to increase

A 3. If as price decreases by 5 percent, total revenue increases by 5 percent, then demand is
(a) elastic
(b) unit elastic
(c) inelastic, but not perfectly inelastic
(d) perfectly inelastic

A 4. Suppose that the price elasticity of demand for peaches is 1.2 and the cross elasticity of demand for peaches and apples is 0.4. Suppose that labor disputes in Washington cause the price of apples to increase. Which of the following should one expect?
(a) Peach prices to increase, quantity of peaches sold to increase.
(b) Peach prices to decrease, quantity of peaches sold to increase.
(c) Peach prices to increase, quantity of peaches sold to decrease.
(d) Peach prices to decrease, quantity of peaches sold to decrease.

- A 5. What is the major difference between stocks and bonds?
- (a) A stock is ownership in a corporation and a bond is debt instrument.
 - (b) A bond is ownership in a corporation and a stock is debt instrument.
 - (c) A stock has value in the marketplace and a bond does not.
 - (d) A corporation can raise cash by issuing bonds, but not by issuing stock.
 - (e) Stocks may be traded internationally, but bonds can only be traded in the country in which they were issued.
- C 6. Which of the following would increase supply?
- (a) A decrease in the price of an alternative output
 - (b) An decrease in consumer income
 - (c) A decrease in the price of an input**
 - (d) A decrease in population
- C 7. A firm with fixed costs earns a profit of exactly zero at its optimal output level only if
- (a) the market price equals its marginal revenue.
 - (b) the market price equals its marginal cost.
 - (c) the market price equals its average cost.**
 - (d) the market price equals its short run average variable cost.
- C 8. Which of the following is not a characteristic of perfect competition?
- (a) Consumers make no differentiation between brands.
 - (b) Firms and consumers all have perfect information about the good and the market.
 - (c) All consumers have identical individual demand curves.**
 - (d) New sellers can enter the market easily.
- D 9. Total fixed cost
- (a) is always zero in the short run.
 - (b) declines as output increases.
 - (c) increases as output increases.
 - (d) remains constant in the short run even if the firm shuts down.**
- C 10. In a short-run equilibrium, a profit maximizing firm in a perfectly competitive industry:
- (a) always earns positive profit
 - (b) always earns zero profit
 - (c) never losses more than its fixed costs**
 - (d) earns positive profit only it has no fixed costs

11. (14 points) The market for wheels of Fromage de Meaux cheese has a supply described by $P=105+Q$ and a demand described by $P=225-2Q$.

a. Calculate the equilibrium quantity and price.

$$105 + Q = 225 - 2Q$$

$$105 + 3Q = 225$$

$$3Q = 120$$

$$Q = 40$$

$$P = 105 + 40 = 145$$

b. Calculate the quantity that would be exchanged if a price floor of 165 were imposed.

Binding price floor at 165,
so quantity exchanged determined by demand.

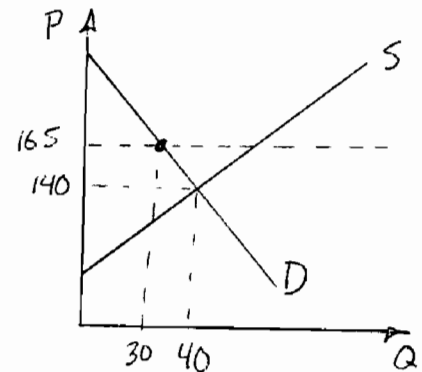
$$P = 225 - 2Q$$

$$165 = 225 - 2Q$$

$$0 = 60 - 2Q$$

$$2Q = 60$$

$$Q = 30$$



12. (11 points) Suppose Iowa consumers buy 12,000 lamps in years when the average income is \$30,000 and the price of a lamp is \$51. When average income rises to \$34,000, Iowans buy 18,000 lamps.

a. Are lamps normal or inferior goods? Why?

normal, consumers buy more when income increases.

b. Calculate the income elasticity of demand for lamps. (Use the midpoint rule.)

$$\bar{E}_Y = \frac{I \cdot (\Delta Q)}{Q \cdot \Delta I} = \frac{\frac{\$30,000 + \$34,000}{2} (18,000 - 12,000)}{\frac{18,000 + 12,000}{2} (\$34,000 - \$30,000)} = \frac{\$32,000 \cdot 6,000}{15,000 \cdot \$4,000} = 3.2$$

13. (15 points) A firm in a perfectly competitive industry has a short run total cost function given by $TC = 140 + 5Q + \frac{Q^2}{20}$ and a marginal cost function given

by $MC = 5 + \frac{Q}{10}$. The market price is 12.

a. What is the total fixed cost of the firm?

$$TC \text{ when } Q=0 \text{ is } 140.$$

b. Calculate the profit maximizing quantity for the firm.

$$MR = MC$$

$$P^* = 5 + \frac{Q}{10}$$

$$12 = 5 + \frac{Q}{10}$$

$$7 = \frac{Q}{10}$$

$$Q = 70$$

c. Calculate the firm's profit or loss if it produces 50 units instead.

$$\pi = TR - TC$$

$$\pi = P^* \cdot Q - TC$$

$$\pi = 12Q - 140 - 5Q - \frac{Q^2}{20}$$

$$\pi|_{Q=50} = 12 \cdot 50 - 140 - 5 \cdot 50 - \frac{50^2}{20}$$

$$\pi|_{Q=50} = 600 - 140 - 250 - 125$$

$$\pi|_{Q=50} = 85$$

14. (20 points) The price of a capacitor increases from 50¢ each to 70¢ 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
50	54,000	6,000
70	46,000	4,800

a. Calculate the price elasticity of demand for capacitors. (Use the midpoint rule.)

$$E_d = \frac{P \mid \Delta Q \mid}{Q \mid \Delta P \mid} = \frac{\frac{50+70}{2} (54,000-46,000)}{\frac{54,000+46,000}{2} (70-50)}$$

$$E_d = \frac{60 \cdot 8,000}{50,000 \cdot 20}$$

$$E_d = 0.48$$

b. Is the demand for capacitors elastic, unit-elastic, or inelastic in this price range?

inelastic, since $E_d < 1$

c. Calculate the cross elasticity for capacitors and thyristors. (Use the midpoint rule.)

$$\frac{P_c \Delta Q_T}{Q_T \Delta P_c} = \frac{\frac{50+70}{2} (4,800-6,000)}{\frac{6,000+4,800}{2} (70-50)}$$

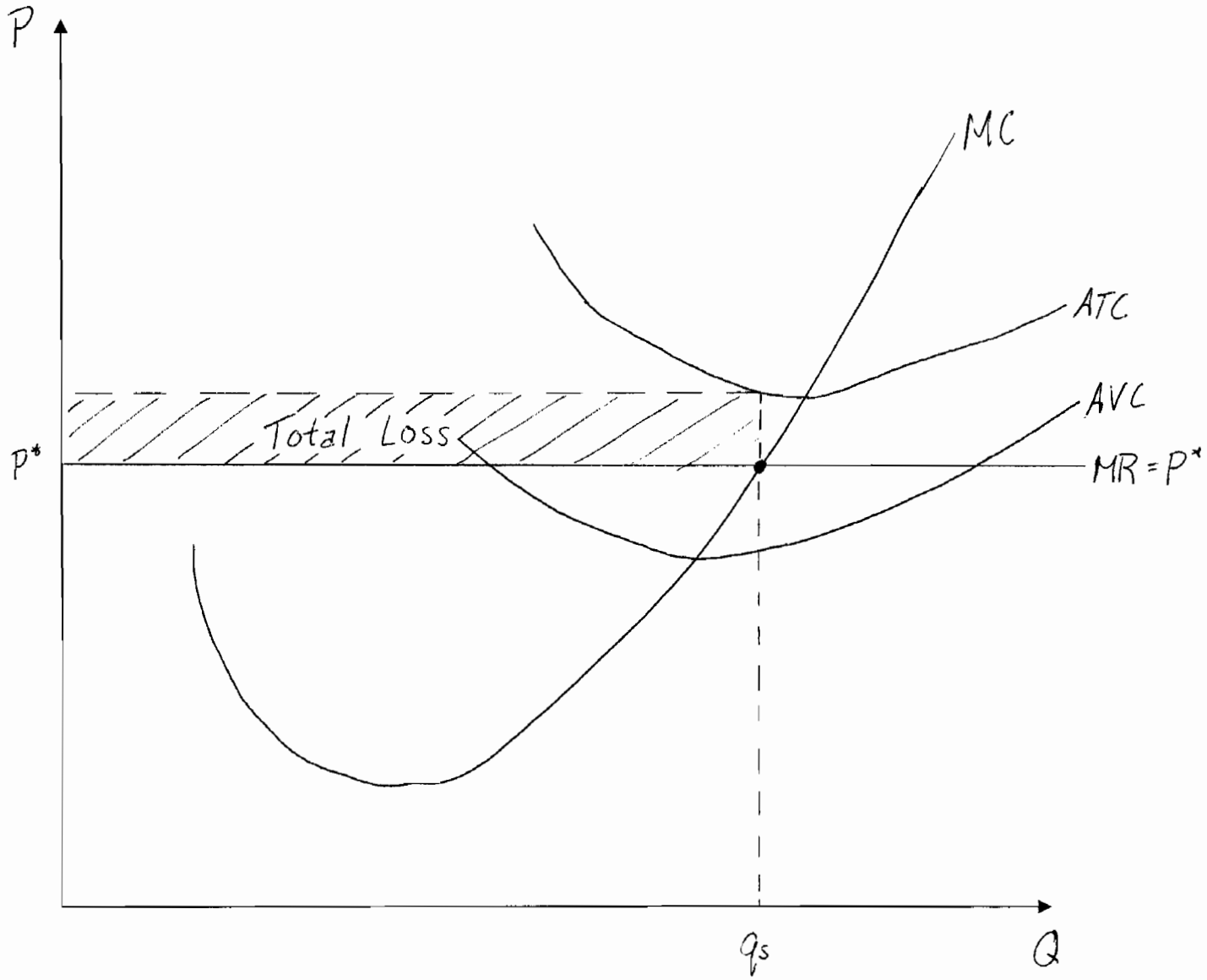
$$= \frac{60 \cdot (-1,200)}{5,400 \cdot (20)}$$

$$= -\frac{2}{3}$$

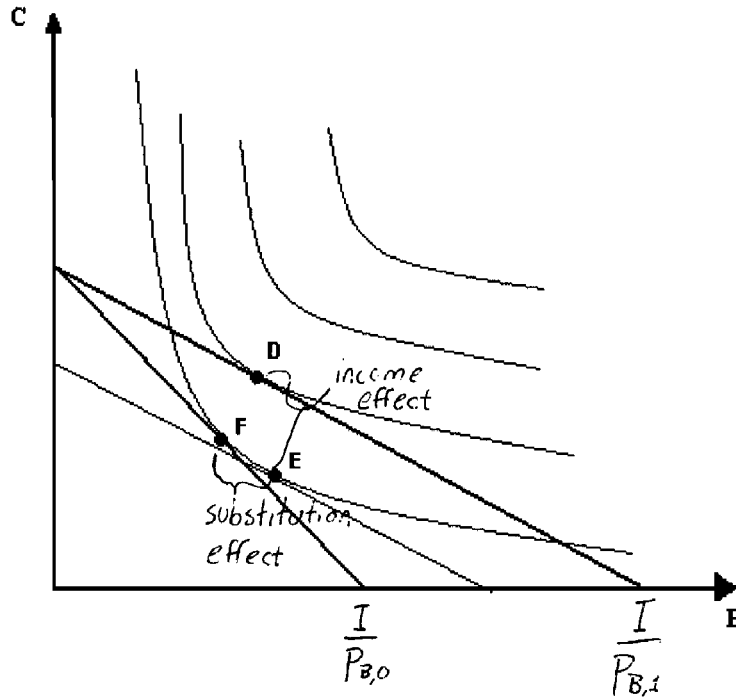
d. Are these goods complements, substitutes, or not related? Why?

Complements, because cross elasticity is negative

15. (15 points) Draw plausible marginal revenue, marginal cost, average total cost, and average variable cost curves for a situation in which a profit-maximizing, perfectly competitive firm operates that produces a positive quantity but operates at a loss. Indicate the quantity the firm supplies and shade the rectangle representing the total loss.



16. (15 points) Bobby has a constant daily income of \$500. He spends it all on two goods: basketballs (B) and chairs (C). In the graph below, the curved lines are indifference curves generated by his preferences and the thick, straight lines are his budget lines before and after a price change. Before the price change, he consumes at point F. After the price change he consumes at point D.



a. Which price changed? Did that price increase or decrease?

Basketballs, decrease

b. Indicate the substitution effect and income effect on the graph.

c. Are basketballs normal or inferior goods?

inferior

d. Are chairs normal or inferior goods?

normal