

Multiple choice: 4 pts. each, circle correct answer.

1. The demand and supply curves for coffee are given by:

i. $Q_d = 600 - 2P$

ii. $Q_s = 300 + 4P$

Equilibrium price and quantity are:

a) $P=500, Q=50$

b) $P=20, Q=300$

c) $P=75, Q=300$

d) $P=50, Q=500$

$Q_D = Q_S$

$600 - 2P = 300 + 4P$

$300 = 6P$

$P = 50, Q = 500$

D

2. As manager of the famous Scottish rock band ME3, you have to decide how to set ticket prices for the upcoming U.S. concert tour. You have narrowed your choices to \$50 per ticket and \$60 per ticket. Fewer people will want to attend at the higher price, and so there will be more empty seats in the stadiums where ME3 plays. More empty seats along with the higher price may be better than fewer empty seats at the lower price if

a) demand is elastic

b) demand is inelastic

c) ME3 concerts are a luxury good

d) ME3 concerts are a normal good

B

3. Suppose that you work as a "gutter" in a chicken processing plant and that you are paid your monthly income in kind: you get forty chickens per week. Only one other good, grapefruit, is produced, and there is no money in this economy at all. Goods are bartered by persons not content with their holdings of chickens and grapefruit. Other individuals are willing to trade at the rate of 2.5 grapefruit per chicken. Only one of the following bundles could be utility maximizing for you. Which one?

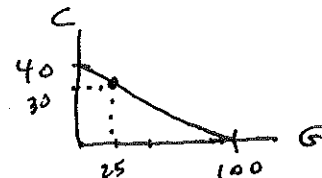
a) 35 chickens, 10 grapefruit

b) 30 chickens, 25 grapefruit

c) 25 chickens, 50 grapefruit

d) 10 chickens, 60 grapefruit

B



4. MP_L in the production of coconuts is 120, while MP_K in the production of coconuts is 30. MP_L in the production of fish is 40, while MP_K in the production of fish is 10. At the next tribal council, you should propose

a) Shifting labor from the production of fish to the production of coconuts.

b) Shifting labor from the production of coconuts to the production of fish.

c) Prohibiting others on the island from bartering with one another, since some people end up eating more fish or more coconuts than is good for them.

d) Checking to see whether $MRT = MRS$, since the allocation of labor and capital to coconuts and fish is efficient.

D

$$MRTS_{L,K} = \frac{MP_L}{MP_K}$$

efficiency in production:

$$MRTS_{L,K}(C) = MRTS_{L,K}(F)$$

$$\frac{120}{30} \stackrel{?}{=} \frac{40}{10} : \text{yes}$$

5. Crusoe's and Friday's demands (marginal willingness to pay) for trebuchets are given below:

	$\Sigma = 60$ Q=1	$\Sigma = 45$ Q=2	$\Sigma = 30$ Q=3	$\Sigma = 15$ Q=4	Q=5
Crusoe	\$20	\$15	\$10	\$5	\$0
Friday	\$40	\$30	\$20	\$10	\$0

If the marginal cost of building a trebuchet is \$20, the socially optimal number of trebuchets is

C

- a) 1
b) 2

(c) 3
(d) 4

$$\Sigma WTP > MC ?$$

6. Situation A: $P=\$5$, $AFC=\$2$, $AVC=\$7$; Situation B: $P=\$7$, $AFC=\$9$, $AVC=\$5$. The firm should:

B

- a) shut down in both situation A and situation B
(b) shut down in situation A but produce in situation B
c) produce in situation A but shut down in situation B
d) produce in both situation A and situation B

$$P < AVC, \text{ shut down}$$

7. A firm's long-run total cost curve is given by $TC(Q) = 1000Q - 30Q^2 + Q^3$. At what output is LRAC at a minimum?

C

- a) $Q=5$
b) $Q=10$
(c) $Q=15$
(d) $Q=20$

$$MC = \frac{dTC}{dQ} = 1000 - 60Q + 3Q^2$$

$$AC = \frac{TC}{Q} = 1000 - 30Q + Q^2$$

8. Which of the following best fits the characteristics of a perfectly competitive market?

B

- a) Fast food restaurants
(b) Mutual funds
c) Personal computer operating systems
d) Automobile manufacturing

$$AC = MC \text{ at min AC}$$

$$1000 - 60Q + 3Q^2 = 1000 - 30Q + Q^2$$

$$-30Q + Q^2 = -30Q + Q^2$$

$$2Q^2 = 30Q$$

$$Q = 15$$

9. Knowing that you have become an expert on the functioning of perfectly competitive markets as a result of taking intermediate microeconomics, over summer break your parents ask you to explain something to them. They grow soybeans on the family farm. They have just learned of the development of a new drought-resistant and insect-resistant seed that will reduce the cost of growing soybeans. In trying to decide whether they can afford to send you back to college in the fall, they need to know what is going to happen in the soybean industry as a result of this cost-reducing technological advancement. What do you tell them?

A

- (a) Short-run profits for early adopters, which gradually dissipate as market supply increases and price falls from its current level.
b) Price will fall in the short run, but return to its current level in the long run.
c) Market demand will increase, leading to short-run and long-run economic profits.
d) Market supply will decrease because firms in the industry will exit as a result of short-run losses.

10. Ralph and Gordon, owners of a local grocery store, are the only sellers of milk in the neighborhood. Their marginal cost is \$1.70 per gallon. They know from experience that a 10% change in price results in a 40% change in quantity demanded. Given this information, what price should Ralph and Gordon charge for their milk?

C

- a) \$1.70
b) \$2.00
(c) \$2.27
d) \$2.50

$$\frac{P - MC}{P} = \frac{1}{E}, \quad E = \frac{\% \Delta Q}{\% \Delta P} = \frac{40}{10} = 4$$

$$\frac{P - 1.70}{P} = \frac{1}{4}, \quad P - 1.7 = .25P$$

$$.75P = 1.7$$

$$P = 2.27$$

11. (15 pts.) Wanda wants to be a court stenographer, and takes classes at a local training school. She consumes two goods, stenography classes (SC) and other goods (OG). Her monthly income is \$500. The tuition charge per stenography class is \$50. Wanda currently is taking four classes per month. (So that you know what type of good stenography classes are for Wanda, last year, when her monthly income was \$400, she only took three classes per month.)

- Illustrate Wanda's current situation in a budget constraint-indifference curve diagram and label it (a).
- Because she has done so well in the program, Wanda qualifies for a partial tuition scholarship. The school reduces her tuition so that she only pays \$25 per class. Wanda increases her classes to six per month. Illustrate her new situation in the diagram and label it (b).
- Decompose the total effect of the tuition scholarship into its income and substitution components. Carefully label and explain.

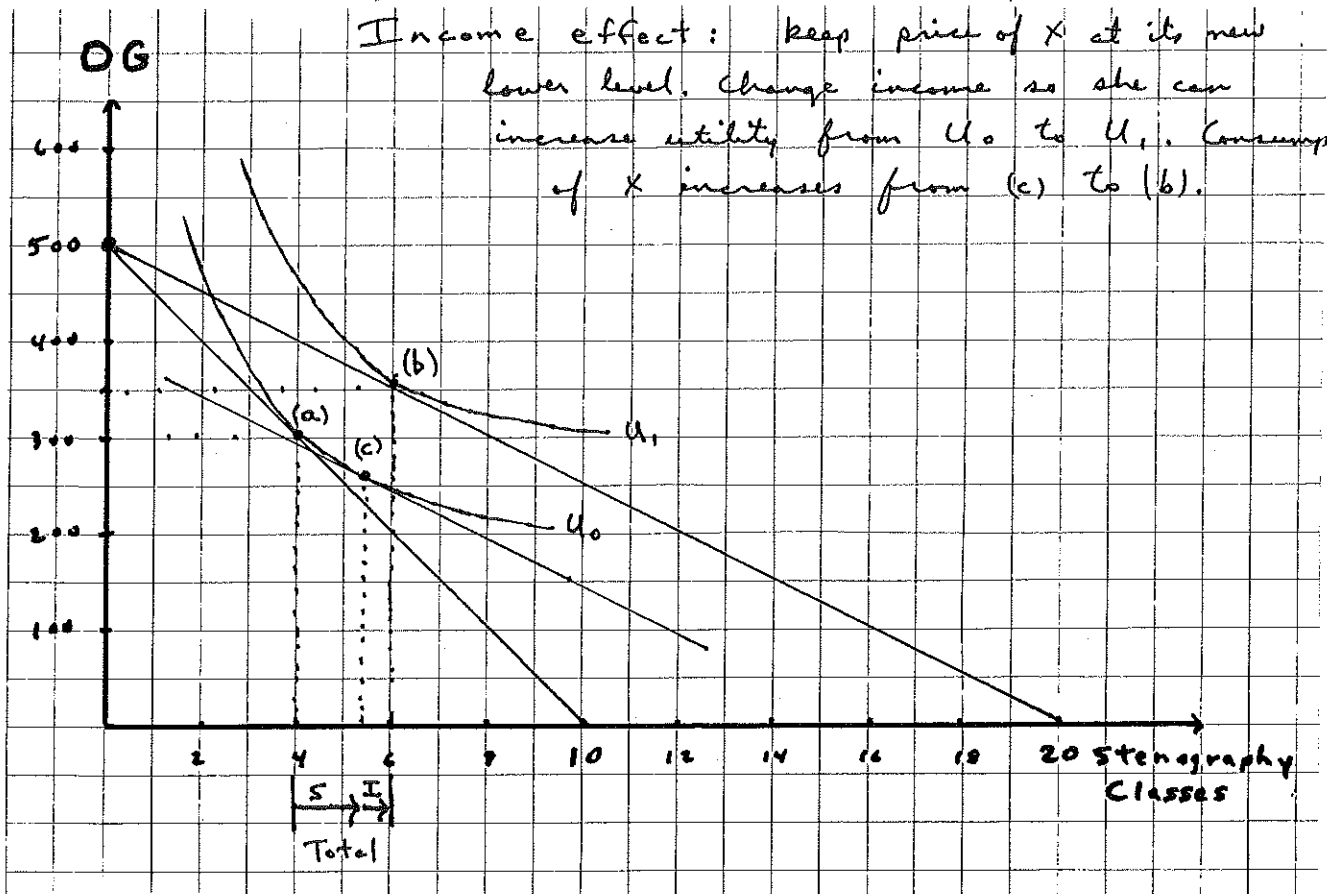
(a) $I = 500$, $P_x = 50$, $P_{OG} = 1$, $x^* = 4$, $OG^* = 300$

(b) $I = 500$, $P_x = 25$, $P_{OG} = 1$, $x^* = 6$, $OG^* = 350$

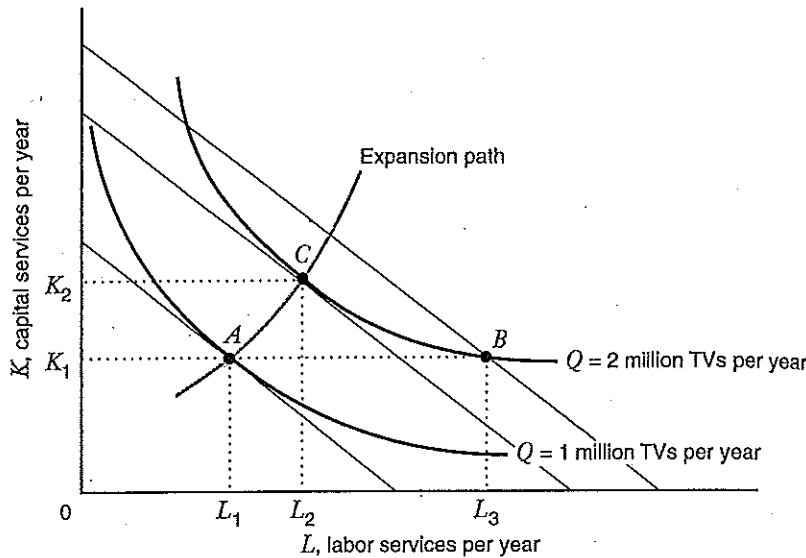
(c) Total effect of drop in price of X: (a) to (b),
 x^* increases from 4 to 6

Substitution effect: keep utility at U_0 , lower the price of X. Consumption of X increases from (a) to (c).

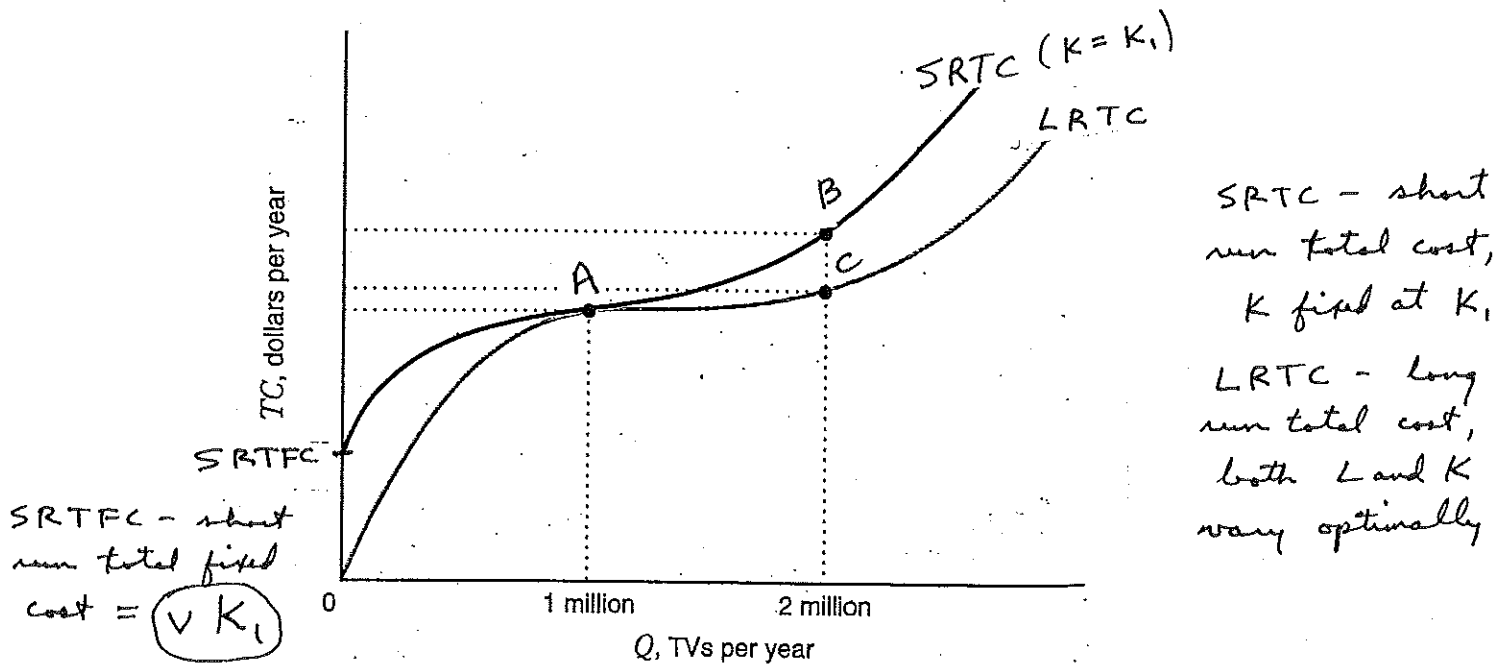
Income effect: keep price of X at its new lower level. Change income so she can increase utility from U_0 to U_1 . Consumption of X increases from (c) to (b).



12. (10 pts.) Use the following diagram to answer the questions below:



- Label the two curves in the diagram below.
- In the figure below, label the points corresponding to A, B, and C in the diagram above.
- If input prices for L and K are w and v , write an algebraic expression for the vertical intercept of the upper curve in the diagram below.



- A \Rightarrow minimum possible total cost of producing $Q = 1m$
- C \Rightarrow minimum possible total cost of producing $Q = 2m$
- B \Rightarrow minimum possible total cost of producing $Q = 2m$, given that K is fixed at K_1 .

13. (10 pts.) On the other side of your professor's family tree, brother-in-law Bill owns a restaurant/bar in Mount Pleasant, South Carolina. On a recent visit Bill shared the following information:

Income Statement for Bill's Bar

<u>Costs</u>		<u>Revenues</u>	
Wholesale cost of food and beer	\$40,000	Sales of food and drinks	\$130,000
Wages and salaries (including \$20,000) for himself	\$50,000		
taxes and insurance	\$12,000		
interest paid on bank loans \$100,000 @ 10%	\$10,000		
	\$112,000		
		<u>Net Revenue</u> (accounting profit)	
		\$130,000 - \$112,000 =	\$18,000

Bill has \$150,000 of his own money invested in the bar. He anticipates that business will continue like this for the foreseeable future. Bill also has a standing offer of \$30,000 to manage another bar in Mount Pleasant, something he considers equally attractive to his current situation. Suppose a national restaurant/bar chain offers Bill \$250,000 to sell his bar, which would enable him to pay back the \$100,000 bank loan and recoup his own \$150,000. Should he take the offer? (Hint: what are Bill's economic profits?)

Explicit Costs \Rightarrow \$112,000

Implicit Costs:

- opportunity cost of his time \Rightarrow \$10,000
 $\$30,000$ (best alternative) minus
 $\$20,000$ he pays himself
- foregone interest earnings on his own investment in the business: $\$150K @ 10\%$ \Rightarrow \$15,000

Total ~~Cost~~ Economic Costs $\$137,000$

Economic Profit = $TR - TC = -\$7,000$

He should sell the bar, work for someone else, and put his \$150K in the bank at 10%. At the end of each year he would have earned \$45,000 (\$30K in salary and \$15K in interest and dividends). Currently he earns \$38,000 per year (\$20,000 in salary and \$18,000 in accounting profit).

14. (10 pts.) Suppose that the mayor's sister is granted a monopoly charter by the Lexington city council to operate a Frisbee golf course. She can produce any level of output that she wishes at a constant average and marginal cost of \$5 per unit ($MC=AC=\5). Since she owns the only Frisbee golf course in town, anyone who wants to play must patronize her course. Assume that all Frisbee golfers are alike, and each one has an annual demand for playing that is given by $Q=70-2P$, where Q refers to the number of rounds played per year and P refers to price.

a) Derive her marginal revenue function, carefully showing each step of your work.

$$\begin{aligned} \text{demand: } Q &= 70 - 2P \\ \text{inverse demand: } P &= 35 - Q/2 \\ \text{total revenue: } TR &= P \cdot Q = 35Q - Q^2/2 \\ \text{marginal revenue: } MR &= \frac{dTR}{dQ} = 35 - Q \end{aligned}$$

b) Solve for the profit-maximizing output and price, again showing each step of your derivation.

$$\begin{aligned} \text{Profit maximization occurs where } MR &= MC \\ MC = 5, \quad MR &= 35 - Q \end{aligned}$$

$$35 - Q = 5$$

$$Q^* = 30$$

$$P^* = 35 - Q/2 = 20$$

c) Calculate her profits, showing your work.

$$\pi = TR - TC$$

$$\text{for } Q = 30 \text{ and } P = 20, \quad TR = 600$$

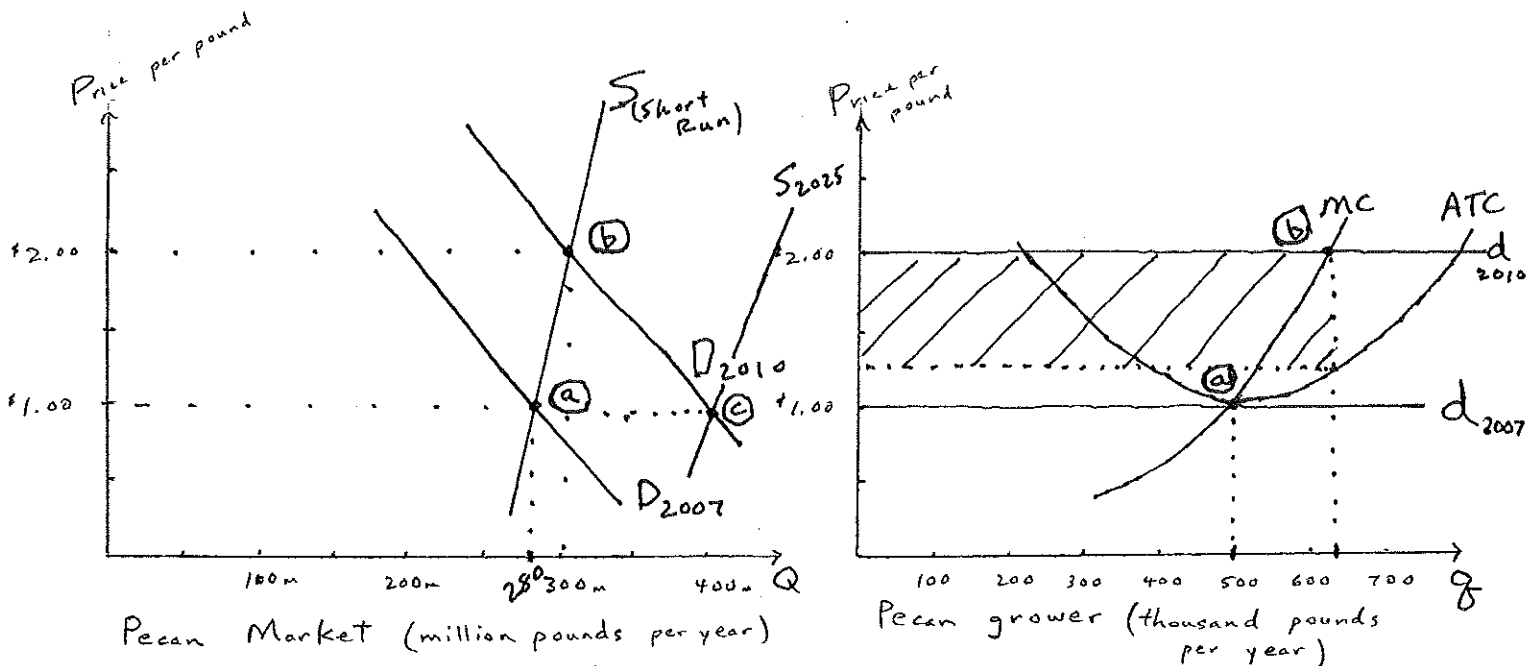
$$\text{for } Q = 30 \text{ and } AC = 5, \quad TC = 150$$

$$\pi = 600 - 150 = 450$$

15. (15 pts.) "Life is good for pecan growers" (*WSJ*, 4/18/11). Chinese consumers have discovered the joy of eating pecans, causing the price of pecans in the shell to increase from \$1 to \$2 per pound between 2007 and 2010. The amount of pecans harvested in the U.S. grew from 280 million pounds to 300 million pounds as a result. Assume that the industry was in long-run equilibrium in 2007. Also assume that a typical pecan grower was producing 500,000 pounds of pecans per year under those market conditions.

- Illustrate the initial 2007 long-run equilibrium in the pecan market. Label both the market outcome and the firm's output choice with (a).
- Show the 2010 market outcome and label it (b). What happens to a typical pecan grower's output and profits? Label with (b).
- Given that it takes over a decade for a newly planted pecan tree to start bearing nuts, explain what you think will happen in this market over time. Illustrate what you think the market will look like in 2025 and label (c).

(a) $P = \$1$, $Q = 280 \text{ m}$ in 2007
 firm produces $q = 500,000$ and earns zero economic profit



(b) Increase in market demand pushes price up to \$2. Equilibrium quantity increases to 300 m, indicating very inelastic short-run supply curve for pecans. Firm increases output to point where $P = MC$, and earns positive economic profit equal to \square .

(c) Pecan trees planted now will shift the market supply curve for pecans in ten years. Eventually we predict that entry of new firms and expansion by existing firms will ~~bring~~ shift market supply enough so that price returns to the \$1 per pound range.