

Fall 2010 D. Hamermesh

ECO 304K: INTRODUCTION TO MICROECONOMICS (Unique No. 33315)

Course Outline and Required Reading

OFFICE HOURS: D. Hamermesh, 2.162 BRB (just north of Gregory Gym)
Monday, 9:45-11:45, Wednesday 12-2, or by appointment

WEBSITE: www.eco.utexas.edu/faculty/hamermesh/class.html

Teaching Assistants: To be announced in class.

BOOKS, etc.:

1. G. Stone, Core Microeconomics, with Course Tutor. Worth, 2009, 1st edition (paper) **STONE**. ISBN 1-4292-15372
2. D. Hamermesh, Economics Is Everywhere. Worth, 2010 (paper) **EIE** ISBN 1-4292-36868; and the three are packaged as 1-4292-4433-X. These can be purchased anywhere, including direct from the publisher online.
3. Course Packet of materials for ECO 304K with D. Hamermesh, to be downloaded by you from the website listed above.

EXAMS:

There will be two 75-minute-long exams in class, **Thursday, Sept. 23** and **Thursday, Oct. 28**. The first will be all short essay; the second will be part short essay, part multiple-choice. There will be multiple-choice quizzes (8 in total) in class except Thursdays, Aug. 26, Sept. 23, Sept. 30, Oct. 28, Nov. 4, Nov. 25 and Dec. 2. **The final exam will be MONDAY, Dec. 14, 2-4:30PM. Please do not plan to leave campus before that date.** EXCEPT FOR CONFLICTS WITH OTHER FINAL EXAMS or a compelling personal reason, you must take the final exam at this time. The final will be entirely multiple-choice. All tests will include questions based on the lectures. There will be a Q&A session shortly before each midterm and the final.

Copies of past tests are in the course packet along with suggested answers to them. Quiz answers will be posted on the website the afternoon of the quiz. The website will also contain an occasional "Economic Thought of the Day"—consult it regularly! Most of these can also be read, along with interesting thoughts by other economists, at <http://freakonomics.blogs.nytimes.com/> . Also, I will send occasional announcements/reminders through email.

GRADING: Possible Grades are A, A-, B+, B, B-, etc.

Standard: The quizzes count 15 percent in total, with the lowest two scores being discarded (including up to two missed quizzes). Each midterm counts 20 percent; the final exam counts 40 percent. (There are no make-up quizzes or midterms.) The remaining 5 percent of the grade is based on an original "**Story**" that you submit in class on November 18. The course grade is based on total points, not 90-80-70 etc.; thus on a midterm, the highest B is only slightly different from the lowest A.

If you miss a midterm, your course grade will continue to be based 15 percent on the quizzes, 20 percent on the other midterm, 5 percent on the "Story," but 60 percent of the grade will be based on the final exam. Scores on quizzes and exams will be available on eGradeBook.

The "Hammer Homer": If your final exam score is in the top 5 percent, and you would otherwise have not gotten at least an A-, you receive an automatic A- for the course **IF** you have turned in a passing "Story" **AND** you have taken **BOTH** midterms.

The first paragraph of the one-page double-spaced "**Story**" must state something that you have observed in the real world, in family life, in a song (list the relevant lyrics) or a movie (describe the scene). The second paragraph must analyze how the item described in the first paragraph illustrates a particular economic concept covered in class. The "**Story**" cannot duplicate any in Economics Is Everywhere or any story, song or movie

discussed in class. Also, it cannot be one of those discussed in Dirk Mateer, Economics in the Movies (Thomson, 2005), a little workbook that you may find interesting. The story must be printed out—no email attachments accepted—and handed in at the end of the lecture Thursday, November 18.

SCHEDULE:

Week ending	Topic	Chapters or pages	
August 27	Scarcity	1, incl. Appendix; start 2.	1
September 3	Supply and demand	Finish 2, except pp. 41-47; 3.	2
September 10	Supply and demand	4, except pp. 88-98 and 102-103; start 5.	3, 4
September 17	Elasticity; nature of demand	Finish 5, except pp. 128-131; start 6.	5
<u>Policy Lecture: Health</u>			
September 24	Nature of demand	Finish 6, except Appendix; pp. 282-286.	6
FIRST MIDTERM, September 23			
October 1	Production; short-run costs	7.	7, 8
October 8	Short-run output decisions; the long run	8.	9, 10, 11
<u>Policy Lecture: Voting</u>			
October 15	Monopoly.	217-230	12, 13
October 22	Monopolistic competition; game theory	10, except pp. 258-261	14
October 29	Oligopoly	230-249	
SECOND MIDTERM, October 28			
November 5	Discounting; input markets.	pp. 287-292 and 296-307.	15, 16
<u>Policy Lecture: Sports</u>			
November 12	Income distribution; discrimination	12, except pp. 327-333; 14; “automation reading.”	17
<u>Policy Lecture: Social Security</u>			
November 19	Externalities and pollution	pp. 93-98; 13.	18
November 26	Taxation	pp. 102-103, 127-131	19
December 3	International trade	pp. 41-47; 15. “sweatshop reading.”	20

SOME HELPFUL CALCULUS-BASED DESCRIPTIONS OF ECONOMICS 304K TOPICS

1. ELASTICITY OF DEMAND

$Q_D = F(P)$, where F is the demand function. The elasticity of demand is:

$$\left\{ \frac{dQ_D}{Q_D} \right\} / \left\{ \frac{dP}{P} \right\} = d \log(Q_D) / d \log(P) = \% \Delta Q_D / \% \Delta P .$$

2. THE RELATIONSHIP OF AVERAGE AND MARGINAL COST

$AC = C(Q)/Q$, where Q = output and C is total cost. Then:

$$dAC/dQ = \left\{ \frac{QC'(Q) - C(Q)}{Q^2} \right\} = \left\{ \frac{C'(Q) - C(Q)/Q}{Q} \right\} \geq 0 \text{ as}$$

$C'(Q) - C(Q)/Q \geq 0$, and thus as $MC - AC \geq 0$, since $MC = C'(Q)$. Thus if AC is increasing in Q , $MC > AC$; if

AC is decreasing, $MC < AC$; and if AC is constant, $MC = AC$.

3. THE OUTPUT OF THE COMPETITIVE FIRM

The firm wants to maximize profits:

$\pi = QP - C(Q)$, where P = price which the competitive firm takes as given.

Max π : Set $d\pi/dQ = P - C'(Q) = 0$, or $P = C'(Q)$, which means setting price = marginal cost.

4. THE MONOPOLIST'S OUTPUT

The firm wants to maximize profits:

$\pi = QP(Q) - C(Q)$, where P is a decreasing function of Q .

Max π : Set $d\pi/dQ = d[QP(Q)]/dQ - C'(Q) = P(Q) + QP'(Q) - C'(Q) = 0$.

Note that $MR = d[QP(Q)]/dQ = P(Q) + QP'(Q)$, since QP is revenue;

and since $MC = C'(Q)$, this means setting $MR - MC = 0$, or $MR = MC$.

If we multiply MR by $1 = P(Q)/P(Q)$, we get:

$$MR = P(Q) + P(Q)QP'(Q)/P(Q) ;$$

$$= P(Q) \left\{ 1 + QP'(Q)/P(Q) \right\} ;$$

$$= P \left\{ 1 + 1/E_D \right\} \leq P, \text{ where } E_D = \left\{ dQ/Q \right\} / \left\{ dP/P \right\} \text{ (since } P'(Q) \text{ is just another way of writing}$$

dP/dQ), the elasticity of demand for the monopolist's product. Thus $MR = 0$ when $E_D = -1$, which is why the monopolist never produces on the elastic part of the demand curve.

5. CHOICE OF THE AMOUNT OF LABOR TO EMPLOY

$\pi = PQ - WL$, where W is the wage rate, L the amount of labor, and $Q = F(L)$ is output in the short run.

Maximize profits with respect to L :

$d\pi/dL = PF'(L) - W = 0$, which means setting $PF'(L) = W$. But $PF'(L)$ is the VMP (MRP if the firm has product-market power), so this means setting $VMP = W$ (or $MRP = W$).

6. PRESENT VALUE

In continuous time the present value of a constant stream of payments of X dollars per year over T years is:

$\int_0^T X e^{-rt} dt$, where r is the annual rate of interest. Integrating this yields the present value:

$$PV = X[1 - e^{-rT}]/r. \text{ Note that as } T \rightarrow \infty, PV \rightarrow X/r.$$

HEALTH AND HEALTH CARE STATISTICS

		White		Black	
		Male	Female	Male	Female
1. Life expectancy					
at birth	1960	67.5	74.2	61.5	66.5
	1980	70.7	78.1	63.8	72.5
	2006	75.7	80.6	69.7	76.5
at age 20	1960	70.2	76.3	65.6	70.1
	1980	72.5	79.4	66.4	74.9
	2006	76.6	81.3	71.3	77.8

2. Hospitals	1980	1990	2006
Average length of stay (days)	7.6	7.2	4.8
Average cost per day (community hospitals), 2002 dollars	\$562	993	1,450 (2004)

3. Prices and Expenditures	1960	1975	1990	2007
Medical prices relative to CPI (1982-84=1.00)	.75	.88	1.24	1.75 (2009)
Percent of expenditures covered by:				
Private			33.4	36.2
Government			38.9	45.2
Other			5.0	4.4
Self			22.7	14.2
Percent of people not covered by health insurance				15.3
Health expenditures as a percent of GDP	5.1	8.2	12.3	15.9

4. Physicians	1960	1975	1990	2007
Per 100,000 population	148	188	246	311

FACT SHEET ON PERFECT COMPETITION

ASSUMPTIONS

1. MANY FIRMS
2. ALL TAKE PRICE AS GIVEN (FIRM'S DEMAND CURVE IS PERFECTLY ELASTIC)
3. FREE ENTRY AND EXIT OF FIRMS

RESULTS, SHORT RUN

1. FIRMS SET OUTPUT WHERE $P = MC$, AT OR ABOVE MINIMUM AVC
2. SUPPLY CURVE IS MC ABOVE MINIMUM AVC: LOSE NO MORE THAN FIXED COSTS, MAY MAKE PROFITS

RESULTS, LONG RUN

1. NEW FIRMS ENTER IF ATTRACTED BY EXISTING OR LONG RUN POTENTIAL PROFITS;
FIRMS EXIT IF REPELLED BY LOSSES
2. EQUILIBRIUM PRICE AT MINIMUM LRAC; PRODUCE AT MOST EFFICIENT SIZED PLANT
3. $P = LRMC$ - NOT BECAUSE FIRMS CHOOSE THIS, BUT BECAUSE FREE ENTRY AND EXIT LEAD TO IT.
4. $P = LRMC$ IS SOCIALLY OPTIMAL –
VALUE OF LAST UNIT OF OUTPUT = VALUE OF INPUTS INTO IT
5. LR INDUSTRY SUPPLY IS UPWARD SLOPING IF MIN. LRAC FOR FIRMS RISES AS INDUSTRY Q INCREASES

STATISTICS ON HOUSEHOLD INCOMES IN THE UNITED STATES

PERCENT OF HOUSEHOLDS BY INCOME

INCOME AT SELECTED PERCENTILES (2008\$)	2008	1994	1980	1967
20 th	\$20,712	\$19,288	\$18,604	\$16,909
50 th (median)	50,303	46,351	44,059	40,261
80 th	100,240	90,279	78,316	66,735
95 th	180,000	157,771	126,035	107,091
Gini Coefficient	0.466	0.456	0.403	0.397

2010 "Guesstimate": Median Household Income in U.S. = \$52,000 TX = \$50,000

PERCENT DISTRIBUTION OF BEFORE-TAX INCOME

Going to:	2008	1994	1980	1967
Top 5% of Households (Part of the highest 20%)	21.5			17.5
Highest 20%	50.0	49.1	44.1	43.6
Next 20%	23.3	23.4	24.7	24.2
Middle 20%	14.7	15.0	16.8	17.3
Next 20%	8.6	8.9	10.2	10.8
Lowest 20%	3.4	3.6	4.2	4.0
Total	100.0	100.0	100.0	100.0

Most from Web site: <http://www.census.gov/prod/2009pubs/p60-236.pdf>

SOCIAL SECURITY FACTS

A. SURVIVORS AND RETIREMENT BENEFITS AS A PERCENT OF U.S. DISPOSABLE INCOME

1960	2.9%
1970	3.8
1980	5.3
1990	5.4
2008	4.7

B. TAX FACTS

	OASDHI Tax Rate (Employee and Employer Each Pay This)	Maximum Taxable Earnings at Full Rate
1960	3.0%	\$4,800
1970	4.8	7,800
1980	6.13	25,900
1990	7.65	49,600
2010	7.65	106,800

DETERMINED BY PER ANNUM WAGE GROWTH

C. BENEFITS AS PERCENT OF EARNINGS IN THE YEAR BEFORE RETIREMENT

	Low-Earning Worker	Median Worker	High-Earning Worker
1960	49	33	30
1970	49	34	29
1980	68	51	33
1990	58	43	24
2010	56	41	29

ECONOMICS 304K
Problem Set 1

D. Hamermesh

A. Table 1 gives the demand and supply schedules for BluRay players in the United States:

TABLE 1

Price (\$ per player)	Quantity Demanded (Million players per year)	Quantity Supplied (Million players per year)
1000	2	25
600	4	20
400	6	15
200	10	10
100	14	8
50	25	5

1. Use the information in Table 1 to fill in the missing information in Table 2. Compute the price elasticity of demand for changes in price from P_0 to P_1 using the "arc-elasticity" method presented in class. In column (9) state whether the demand schedule is elastic (E), unit elastic (U) or inelastic (I) over this price change.

TABLE 2

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
P_0	P_1	Change in Q_d	$\frac{(3)}{\text{Average } Q_d}$	Change in P	$\frac{(5)}{\text{Average P}}$	$\frac{(4)}{(6)}$	Elasticity	
1000	600	+2		-\$400				
600	400							
400	200							

2. Plot the demand and supply curves for BluRay players on a graph.

3. The equilibrium price is _____. The equilibrium quantity bought and sold is _____.

4. Assume now that the supply schedule has shifted outward each year before this due to technological improvements, so that a different equilibrium price has been established each year, as shown in column (2) of Table 3. The demand schedule remains unchanged at what is shown in Table 1.

TABLE 3

(1) Year	(2) Price	(3) Elasticity	(4) Q Sold (from Table 1)	(5) Revenue	(6) Change in Revenue
1	\$1000				
2	\$600	_____			
3	\$400	_____			
4	\$200	_____			

a. How many dollars are spent on BluRay players each year?

b. Enter the price elasticities of demand from Table 2 in column (3) of Table 3. Discuss the relationship between the price elasticities and the year-to-year changes in the revenue from selling BluRay players.

B. Comment on the appropriate pricing policy that should be followed in each situation below, based on your beliefs about the elasticity of demand in each case.

1. Land telephone lines 15 years after the introduction of cell phones (right about today).
2. Tickets to hear a lecture by the Dalai Lama on campus.
3. Tickets from Austin to Denver on American Airlines after Southwest Airlines began service to Denver.
4. Tickets for UT football games in the season after yet another bowl game defeat.

ECONOMICS 304K

D. Hamermesh

Problem Set 2

1. *Danny's Durian, Inc.*, must pay \$500 per week to the bank that helped start the company, no matter how many bags of durian fruit that it sells. It employs durian pickers who are paid \$200 per week.

a. Fill in the table below showing hourly productivity and weekly costs.

#Workers	Output (bags)	MP_L	AP_L	TFC	TVC	TC	AFC	AVC	ATC	MC
0	0	----	----							
1	100									
2	240									
3	330									
4	400									
5	440									
6	460									

b. In your table, where do diminishing returns set in?

2. Danny sells durian for \$4 per bag.

a. How many bags should Danny sell to make the largest profit? What are his profits then?

b. How low would the price have to be before it would no longer pay Danny to continue producing durian? What would his profits be then?

3. Consider the following data for *Louie's Latkes, Inc.*, which caters to the booming market for *latkes* (potato pancakes) in East Texas, and which has no fixed costs. It can sell as many *latkes* as it wants at \$5 per serving:

Output per Day (servings)	Total Cost per Day (\$)
100	\$300
200	500
300	600
400	900
500	1300
600	2000
700	2800
800	3800

Louie must decide on his daily production. He has three advisors:

- Dr. Cox, his marketing consultant, advises him to produce as much as he can so long as he is making a profit..
- Dr. Anderson, his accountant, urges him to sell so that the mark-up, the ratio of price to average cost, is highest.
- Dr. Hamermesh, his economist, tells him to produce where $P \geq MC$ so long as he covers AVC.

Whose advice should Louie follow, and why? Find out what output level each of Louie's advisors is recommending, and calculate daily profits at each of those levels.

ECONOMICS 304K

D. Hamermesh

Problem Set 3

I. A typical firm in the campaign button industry faces the following costs:

\$2.50/button for the first 30,000 buttons

\$4.50/button for each additional button after 30,000

It has no fixed costs.

1. Graph the long-run average and marginal cost curves for the typical firm.
2. If the market price of a button is \$2, how much will the typical firm produce? How much will the firm produce if the price is \$3 per button? How much will the firm produce if the price is \$4 per button? If it is \$5 per button?
3. Is \$4 the long-run equilibrium price? Why or why not? If not, what is the equilibrium price?

II. Industry-wide button demand is:

<u>Price</u>	<u>Quantity</u>
\$5.50	6,000,000
4.50	9,000,000
3.50	12,000,000
2.50	15,000,000
1.50	18,000,000

1. If there is free entry and exit to the button industry, what are industry output and price, and how much does the typical firm sell?
2. How many firms are in the button industry in equilibrium?

ECONOMICS 304K

D. Hamermesh

Problem Set 4

Karl's Kreplachmart is the only seller of *kreplach* (boiled dumplings) in Austin. The demand schedule facing K^2 is:

(1)	(2)	(3)	(4)	(5)	(6)
Q (lbs. per day)	P (per lb.)	Marginal Revenue (per lb.)	Price Elasticity	Marginal Cost	Average Cost
0	\$10	----	----	----	-----
100	9				
200	8				
300	7				
400	6				
500	5				
600	4				
700	3				

- Complete columns (3) and (4).
- Fill in columns (5) and (6) assuming that the cost of producing *kreplach* is \$5 per pound, and there are no fixed costs.
- Find the profit-maximizing output and price for K^2 . What are his profits? Prove that your answer is correct by showing that profits are lower at all other outputs.
- The U.S. Department of Justice, upset at the exploitation of consumers of *kreplach* in Austin by this monopolist, dissolves K^2 into a large number of small companies, each of which produces only ten pounds of *kreplach* per day at a cost of \$5 per pound. What are the new equilibrium price and output of *kreplach* in Austin?

ECONOMICS 304K
Problem Set 5

D. Hamermesh

- I. Hamilton and Burr are facing off in a duel with pistols. Each of them has the choice Shoot or Don't Shoot. The payoff bi-matrix is:

		BURR	
		Shoot	Don't Shoot
HAMILTON	Shoot	(5,2)	(-4,-5)
	Don't Shoot	(-1,3)	(6,-3)

1. Does either duelist have a dominant strategy? If so, which one(s)?
2. What strategy will each duelist choose?
3. Is the outcome a Nash equilibrium? Explain
4. If there is a Nash equilibrium, is it a Pareto optimum?

- II. (A True Story from an ECO 304K student in Fall 2007) John and Cara share cats whose litter box needs to be changed once a week. Their choices are Change or Don't Change, and the payoff bi-matrix is:

		CARA	
		Change	Don't Change
JOHN	Change	(12,8)	(3,9)
	Don't Change	(13,4)	(0,0)

1. Does either partner have a dominant strategy? If so, which one(s)?
2. What strategy will each partner choose?
3. What is going to happen? Can you help John and Cara with their problem?

ECONOMICS 304K

D. Hamermesh

Problem Set 6

I. Francie's Famous Fudge (F3) produces fudge using labor, which it pays for, and materials, which it obtains for free. It produces according to the following schedule.

(1)	(2)	(3)	(4)	(5)
Number of Workers	Boxes of fudge per week	MP_L	Total revenue	MRP_L
0	0			
1	300			
2	700			
3	1000			
4	1200			
5	1300			

1. Fill in column (3) in the table.
2. F3 pays a competitive salary of \$500 per week and sells at \$2 per box. Fill in columns (4) and (5) in the table. How many workers should F3 employ?
3. How does your answer change if the price of fudge increases to \$4 a box? Why?
4. With the recession the supply of fudge-makers increases, and the weekly competitive salary falls to \$300. How does your answer to Question 2 change when this happens? How about your answer to Question 3?

II. You are offered the chance to buy a house that you are absolutely certain you will be able to sell in 10 years for \$1,000,000. The price of the house today is only \$500,000. The only way you can afford to buy the house is to borrow the full amount, with the borrowed amount repayable with interest when you sell the house in 10 years.

Should you make the investment if you can borrow at a zero rate of interest?

At 4 percent?

At 7 percent?

At 10 percent?

ECONOMICS 304K

D. Hamermesh

Problem Set 7

Suppose that the United States and Mexico are the only two countries in the world. In the United States it takes 10 worker-hours to make a ton of computer chips, and 10 worker-hours to make a ton of salsa. In Mexico it takes 30 worker-hours to make a ton of computer chips, and only 10 worker-hours to make a ton of salsa. Labor is the only input into production. The American labor force supplies 1000 worker-hours, and the Mexican labor force supplies 600 worker-hours.

1. Draw the production possibility frontier for chips and salsa for each country.
2. What are the relative opportunity costs of the two commodities in each country?
3. Which country (if any) has an absolute advantage in chips? In salsa?
4. Which country (if any) has a comparative advantage in chips? In salsa?
5. If free trade can occur between the U.S. and Mexico, and there are no transportation costs:
 - a. What commodity should the U.S. import?
 - b. At what possible prices of chips (in terms of salsa) will the two countries be willing to trade?
 - c. Draw the world production possibility frontier for chips and salsa and show that it lies further from the origin than the sum of the frontiers for the two countries if they do not trade at all.

IMPORTANT POINTS TO REMEMBER--MIDTERM 1

The production-possibility frontier shows the combinations of goods that can be produced if resources are used efficiently. If they are, society must trade off some of one good to get more of the other(s); if there is waste, more of all goods can be attained. Technical change in one industry can increase the amount of all goods attainable by freeing up resources from the industry where the improvement occurs. The opportunity cost, the lost output of one good that occurs when more of another good is produced, increases the greater is the production of the second good.

A demand curve or schedule shows how much consumers would be willing to buy of a good at various prices. As we draw the demand curve, we hold income, tastes and the prices of other commodities constant since they may effect demand. NOTE: The law of demand says that demand curves are downward sloping---as the price of the good ↑, the quantity demanded ↓.

Distinction between change in demand (D) and change in amount demanded. Change in D occurs when one of the variables held constant is allowed to change. This shifts the D curve. Change in amount demanded is a movement up or down the D curve when a price changes. (The original curve does not move).

A supply curve shows how much of a good sellers would be willing to supply at different prices. (Certain variables are held constant--- technology and input prices.) The law of supply shows a positive (upward-sloping) relationship between price and quantity supplies. ↑ P implies ↑ quantity supplied. The same distinction between change in S and change in amount supplied exists as with the demand curve.

When buyers and sellers meet in the market place, their bids and offers determine an equilibrium price and output. This equilibrium price and output occur at the point where S and D intersect. This is the only point where neither shortages ($D > S$) nor surpluses ($S > D$) occur, and it is a stable point. NOTE: For this equilibrium price or quantity to change, either the S or D curve or both must shift. In this market adjustment process consumer sovereignty prevails---consumers direct what is to be produced through their dollar votes in the market place.

A fixed price below the equilibrium price (price ceiling) implies $D > S$, shortages and a black market. A fixed price above an equilibrium price (price floor) implies $S > D$ and surpluses. If the price ceiling is above the equilibrium price, or if the price floor is below the equilibrium price, the fixed price is ineffective.

Price elasticity of demand measures the relative responsiveness of quantity demanded to a change in price. The empirical measure of the elasticity of demand is:

$$\epsilon = \frac{\% \text{ ch. in } Q_D}{\% \text{ ch. in } P} = \frac{- \frac{\text{Ch. in } Q}{(Q_1 + Q_2)}}{\frac{\text{Ch. in } P}{(P_1 + P_2)}}$$

If the absolute value of $\epsilon > 1$, this implies that the relevant portion of the D curve is elastic. If $\epsilon < 1$, it is inelastic; if $\epsilon = 1$ it is unit elastic. In general, the more elastic, the relatively flatter is the curve (taken as a whole). NOTE: With demand curves, a second test for elasticity is how a change in P changes total revenue ($Q \times P$). If the demand is elastic, a drop in price raises revenue, a rise in price cuts revenue. If the demand is inelastic, a drop in price cuts revenue, a rise in price raises revenue. The income elasticity measures the percentage change in the amount bought of some good in response to a one-percent increase in income. Depending on whether the income elasticity is > 1 , < 1 , or < 0 , we say the good is a luxury, a necessity or an inferior good.

Utility = satisfaction of wants. Consumers try to maximize their total utility at a given time while tastes are fixed. They face a budget constraint given by their income and the prices of goods. The law of diminishing marginal utility states that the extra satisfaction from another unit of a good eventually starts to decline. With this in mind, it is possible to demonstrate how the consumer chooses what to buy. In trying to maximize utility, they purchase those goods whose net addition to utility (marginal utility) is the highest. Since $MU \square$ they will not buy all of one good, but will split up their purchases until they finally reach equilibrium. At equilibrium, the MU of the last dollar spent on Good 1 equals the MU of the last dollar spent on Good 2. Any change in price both changes the total amount of goods one can purchase (an income effect) and alters the relative price of the good for a fixed income (a substitution effect). Consumer surplus is the amount by which a person's MU exceeds the market price.

IMPORTANT POINTS TO REMEMBER--MIDTERM 2

Short-run -- some factors of production are fixed. Long-run -- all factors are variable. The firm seeks to maximize its economic profit -- its revenue minus the opportunity cost of all the inputs it uses. This is different from accounting cost.

A firm produces by combining inputs given available technology. If all other inputs are fixed at pre-specified quantities, we can relate changes in output to changes in the one variable input. Each extra unit of input changes output by an amount called the marginal product (MP). The principle of diminishing returns says that the MP of this input will eventually decrease as more of it is used with a fixed amount of other inputs. Average product (AP) is defined as output divided by the amount of the single input that is variable in the short run.

In the long run firms choose technologies -- the relative amounts of different inputs -- based on the inputs' relative prices. Where one input is cheap compared to others, businesses will produce in such a way as to use a lot of the input. Where it is relatively expensive, they will use relatively little of it. When the firm chooses the most efficient way of producing, it implicitly determines the cost of producing at each output. In the short run the amount of at least one of the productive inputs is fixed. This means that in the short run the firm incurs fixed costs whether or not it produces. The other inputs can be varied, yielding costs that increase with output (variable costs). Total costs at each output are the sum of fixed and variable costs ($TC = TVC + TFC$).

For purposes of analyzing how firms behave we use the following breakdown of costs:

$$\text{Average Total Cost} = \text{Total Cost}/\text{Output.}$$

Thus $ATC = TC/Q$, $AVC = TVC/Q$ and $AFC = TFC/Q$. Marginal cost, MC , is the change in TC as Q increases by one unit. (It is also the change in TVC , since only variable costs change as output changes in the short run.)

We assume that all firms seek to maximize their profits (revenue minus costs). Marginal revenue (MR) is the change in revenue produced by a one-unit increase in sales.

Perfect competition is defined as a situation in which there are many sellers; each takes the price as given (faces a horizontal demand curve); and there is free entry and exit to and from the market. Each competitor's product is assumed to be identical. Like any other firm, the perfect competitor will in the short run produce where $MR = MC$ (except that MR equals price as well, because the firm's demand is infinitely elastic), so long as $P > AVC$. If the market P falls below minimum AVC , the firm will be better off shutting down than producing, since its losses will be limited to TFC .

The firm's long-run average cost ($LRAC$) shows the most efficient way of producing each particular output given complete freedom to vary inputs. If $LRAC$ is constant, we say there are constant returns to scale; if increasing with output, there are decreasing returns to scale; if decreasing with output, there are increasing returns to scale.

In the long run in a perfectly competitive industry economic profits will be zero. If they are positive, firms will enter and drive down price; if they are negative, firms leave and prices rise, removing losses. If profits are zero, $P = AC$, and the AC is the lowest possible. Firms are forced to operate as efficiently as possible using the plant size best suited for their planned output. Because AC is at its minimum, $P = MC$ also.

The slope of the long-run supply curve in the competitive industry depends on what happens to the $LRAC$ of the typical firm when the industry expands as demand for its product increases. In the typical case (an increasing-cost industry) long-run supply is upward sloping because there are industry-specific inputs whose cost rises as the industry expands. Other cases are constant-cost and decreasing-cost industries.

$P = MC$ also is a condition for efficiency for the entire economy; P is value of output to society, MC is value of inputs needed to make 1 unit of output. This outcome means that society is pulled toward the point on the production possibility frontier that yields the highest satisfaction.

Other market structures are "imperfect competition," such as monopoly, monopolistic competition and oligopoly. In perfect competition, the individual firm was a "price taker" and maximized his profits. Because of unlimited entry in the long run each firm only earned normal (opportunity cost) profits in the long run.

In monopoly, the firm is the industry and thus faces a downward sloping demand curve. This means that (unlike the perfect competitor who could sell as much as he wanted at a given price), the monopolist must lower price to increase sales. This leads to a divergence between P and marginal revenue. Profits are maximized at the output level where marginal revenue equals marginal cost $MR = MC$, and price is read off the demand curve at that output level. The monopolist is thus a "price maker." The monopolist can earn supernormal or excess profits in the long run by effectively preventing entry.

The monopoly produces less output and charges higher prices than would be the case under perfect competition ($P > MR = MC$); it has thus misallocated resources. If the monopoly comes about "naturally" due to a declining average cost curve over a wide-range of output, then this monopoly may be more efficient than a group of competitive firms.

Price discrimination raises the monopolist's revenues by segmenting the market into submarkets and charging different prices in accordance with the different demand elasticities. It also can operate by segmenting the demand curve and charging different prices for different quantities rather than a single price per unit for all units purchased.

Monopolistically competitive firms differentiate their product and thus have similar, but not identical products as in perfect competition. This leads to an individual demand curve that is downward sloping for each firm in the industry. Price and output for each firm are determined in the same way as the monopoly case by equating $MR = MC$ and setting the price from the demand curve at that output. These firms also misallocate resources. These competitors are close but not perfect substitutes and hence have very high elasticities of demand (relatively flat demand curves). We expect normal profits from monopolistically competitive firms in the long run (since market entry is easy).

An oligopoly is an industry composed of a few firms reinforced by high barriers to entry and economics of scale. Because of the fewness of competitors, each firm must consider the reactions of its competitors when it sets price. Because of the uncertainty of competitors' reaction to a change in price, oligopolies usually exhibit price rigidity. By collusive behavior, oligopolists can approximate the same profits as under monopoly, and they usually try to collude if they can.

Oligopolists' strategic interactions are usefully analyzed by game theory. Each player must consider the payoff she receives under each combination of hers and her opponent's strategies. In some cases the choice is apparent, either because both players have dominant strategies or because there is a Nash equilibrium without dominant strategies. Prisoner's dilemma is one game where collusion yields an especially high payoff.

IMPORTANT POINTS TO REMEMBER--LAST THIRD

Discounting converts future dollars to current ones by dividing dollars in year t by $[1+r]^t$, where r is the rate of interest. The present value of a stream of future dollars is the sum of these amounts for years 0 through T , the last year of the stream. Compounding grows current dollars to the future, with a dollar today being worth $[1+r]^t$ dollars in Year t .

The firm's demand for an input is set where the marginal revenue product (MRP) of the input is equal to the input's price. This means that the firm is employing every unit of the input that adds at least as much to revenue as it does to cost. In the short run this is equivalent to the firm's decision to maximize profits where marginal revenue equals marginal cost.

Social Security retirement and disability benefits are financed by an equal tax on employers and employees. Persons retiring before 2000 paid far less than they will take out, while those retiring after 2010 will not earn an especially high rate of return on their taxes. Low-wage individuals receive relatively more in benefits compared to the taxes they and their employers paid than do middle-and high-wage employees.

The best explanation of differences in incomes among families is the theory of human capital, which views education and experience as investments in future earning power. The cost of a college education at UT is perhaps \$100,000, of which the majority is the opportunity cost (foregone earnings). The returns are higher earnings later on than the student would otherwise receive. The rate of return on college education fell in the 1970s, but rose to perhaps 12 percent by 2009. Earnings rise after formal education has ended due to investments in training on the job. The increase is greatest for more educated workers.

Income distributions are skewed, not bell curves. A few people receive huge amounts of income. In 2007 the median household income in the U.S. was about \$50,000; only 5 percent of households had before-tax incomes in excess of \$177,000. Part of the difference in incomes not explained by age and education is accounted for by discrimination--against women and minorities. Adjusting for differences in experience, women earn somewhere from 15 to 20 percent less than men with similar skills. For African-Americans the best estimates suggest the difference compared to whites is 25 percent. The gap has been narrowing for women since the early 1970s; for African-Americans the gap narrowed sharply in the 1970s, widened slightly during the 1980s and has been roughly unchanged since. Racial discrimination in labor market benefits black capitalists and white labor, hurts black labor and white capital.

Federal expenditures aside from Social Security are financed mainly by the individual income tax. That tax is somewhat progressive (taxes an increasing percentage of income as income rises), not neutral (constant percentage) or regressive (decreasing percentage). It and other taxes have average and marginal tax rates. Under the current Federal personal income tax law the marginal rates range from 10 to 35 percent.

An externality is defined as an action that raises or lowers costs or benefits to persons and/or firms not directly involved in the action. Such actions as polluting, playing a radio in a bus, etc., constitute negative externalities.

My improving my house, or buying a street light, generate positive externalities. In all cases such actions lead to a divergence between the price people pay for a product and its marginal cost. The divergence is positive (not enough produced) for a positive externality; it is negative (too much produced) for a negative externality. Externalities provide a justification for government intervention in markets, as a way of removing this divergence and improving resource allocation. Public goods represent extreme positive externalities. For them the quantity available is not reduced when another person consumes more of them.

To improve the environment marginal analysis says that expenditures on pollution abatement should be undertaken if the incremental benefits are greater than the incremental costs. The optimal level of pollution is reached when the incremental cost of reducing it further equals the incremental benefits yielded from further reductions. Market solutions to the pollution problem are: (1) Sell the right to pollute; (2) Subsidize pollution abatement efforts; (3) Charge emission fees to polluters; (4) Impose direct regulations against polluters. All four of these solutions are used.

Trade between nations occurs because the immobility of productive inputs across national boundaries prevents input costs from being equalized. Countries will trade, with each specializing in those commodities in which it has a comparative advantage. Even if one country has an absolute advantage in all commodities, it still pays for it and other nations to specialize, exporting those items they produce relatively most efficiently. Free trade shifts the world's production possibility frontier outward. The size of the shift depends on the extent of differences in relative costs of production among nations--the gains to specialization.

Tariffs and quotas are ways in which countries restrict trade. They make the average person in society worse off by raising prices of the protected goods, but raise the incomes of people in the protected industry. To the extent that those people have below-average incomes, the implied equalization of incomes that the protection produces may be worth the cost of higher prices to consumers. A free-trade area, as between states in the U.S. or countries in the European Community, and as is now true in North America with NAFTA, abolishes all tariffs and quotas in the area. As such it should raise the average level of well-being in each country/state in the area.

NAME AND

UTEID _____

ECONOMICS 304K, FALL 2009
MIDTERM EXAM #1

D. Hamermesh

Answer the questions in the space provided on the test sheet or on the reverse side. **Write your name and UTEID on each page.** You have 80 minutes for the exam, and there are 36 total points. Tests will be handed back and gone over in class next Tuesday. Please begin Chapter 7 in the text for next Tuesday's lecture.

I. (6 points)

During weekends, Mrs. Smith bakes cookies and muffins. She can only prepare the following combinations of cookies and muffins:

Point	Muffins	Cookies
a	0	20
b	5	17
c	9	15
d	12	11
e	14	6
f	15	0

- a. Graph the Production Possibility Frontier for Mrs. Smith and calculate the opportunity cost of **each** of the 13th and 14th muffins. If the PPF is not a straight line, explain why.

- b. To remedy the poor performance of her oven, Ms. Smith begins using a better quality of flour for cookies. How do these actions affect her Production Possibility Frontier? Explain and re-draw.

NAME AND

UTEID _____

- c. Gov. Schwarzenegger announces that the State of California will begin subsidizing the production of oak barrels, which are used in the wine industry. Show the effect that eventually will occur in the market for wine in California.

- d. Diatomaceous earth (DE) is used in pool filters. After a large amount of debris is picked up by the filter, new DE must be added back in. Illustrate what happens in the market for DE after a particularly bad rainstorm that puts debris in pools all over North America.

NAME AND

UTEID _____

III. (6 points)

Consider the seashell market in Port Aransas. Seashell sellers collect shells from the beach to sell in their stores.

a. Suppose a big hurricane hits Port Aransas, washing up many more shells on the beach. What happens to the equilibrium price and quantity in the seashell market? Use a graph to explain your answer.

b. Now suppose that, in addition to the hurricane, shell jewelry becomes very popular. From the initial equilibrium, what can you say about the new equilibrium price and quantity? Use a new graph to explain your answer.

c. The city of Port Aransas enacts a new law that caps the price of seashells at \$3. If the equilibrium price is currently \$4, what problem would occur? Illustrate this situation with a graph.

NAME AND

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IV. (5 points)

Ralph sells breakfast tacos for \$2 each and beer for \$3/can out of a trailer on South Congress.

a. Mark is a customer of Ralph's trailer and buys 4 tacos each morning at the current price. If Ralph were to raise the price of a taco by 50%, Mark would buy only 2 tacos. What is Mark's elasticity of demand for tacos? Is his demand elastic or inelastic?

b. Assuming Mark is a typical buyer, should Ralph raise the price of his tacos?

c. Suppose that Ralph does increase the price of a taco by 50%. Mark reduces his consumption of beer from 4 cans to 2 cans. Are tacos and beer complements or substitutes for Mark?

NAME AND

UTEID _____

V. (2 points)

Laura loves to buy any new fashionable clothing. Every time her income rises she spends $\frac{1}{3}$ of it on clothing. Her income is \$10,000 and she purchases 100 clothing items. If her income rises to \$11,000 and she buys 110 clothing items, what is her income elasticity of demand? Explain why. Is clothing a luxury, a necessity or inferior?

VI. (5 points)

I have a budget of \$18 for lunch. I can either buy pizzas or hamburgers. The price of one pizza is \$6, and the price of one hamburger is \$3.

a. Draw the budget line that I face at lunch.

b. The table below shows my **total utility** (in money terms) for consuming different quantities of pizzas and hamburgers. How many pizzas and hamburgers should I buy if I want to maximize my utility? Explain your reasoning.

Quantity	1	2	3	4	5
Total Utility Pizzas	9	15	18	20	21
Total Utility Hamburgers	7	13	18	22	22.5

NAME AND

UTEID _____

ECONOMICS 304K, FALL 2009

D. Hamermesh

MIDTERM EXAM #1

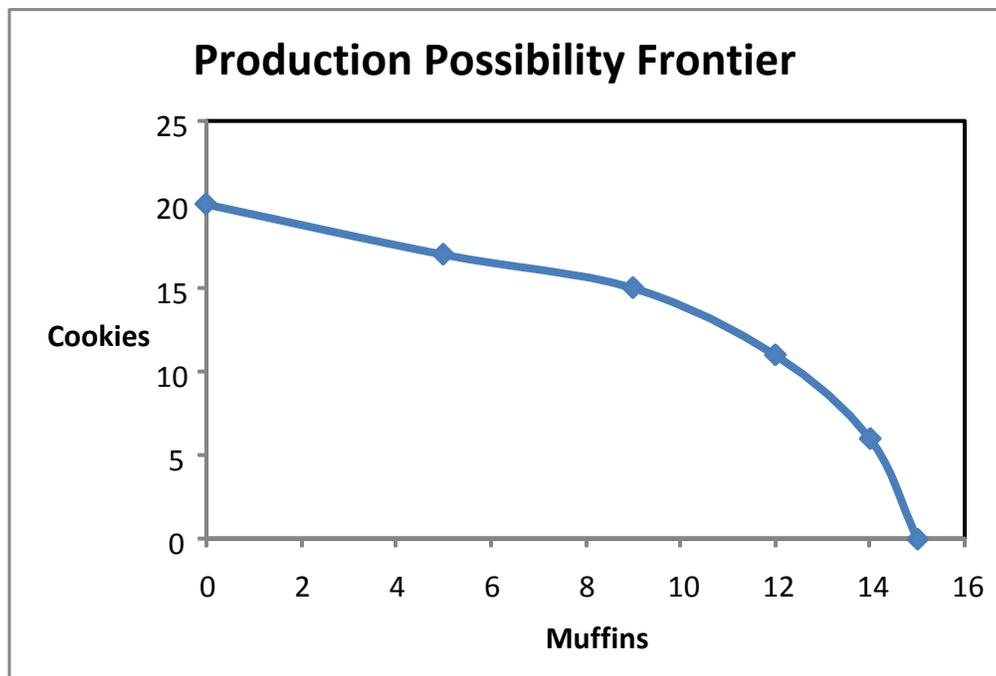
Answer the questions in the space provided on the test sheet or on the reverse side. **Write your name and UTEID on each page.** You have 80 minutes for the exam, and there are 36 total points. Tests will be handed back and gone over in class next Tuesday. Please begin Chapter 7 in the text for next Tuesday's lecture.

I. (6 points)

During weekends, Mrs. Smith bakes cookies and muffins. She can only prepare the following combinations of cookies and muffins:

Point	Muffins	Cookies
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b	5	17
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d	12	11
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f	15	0

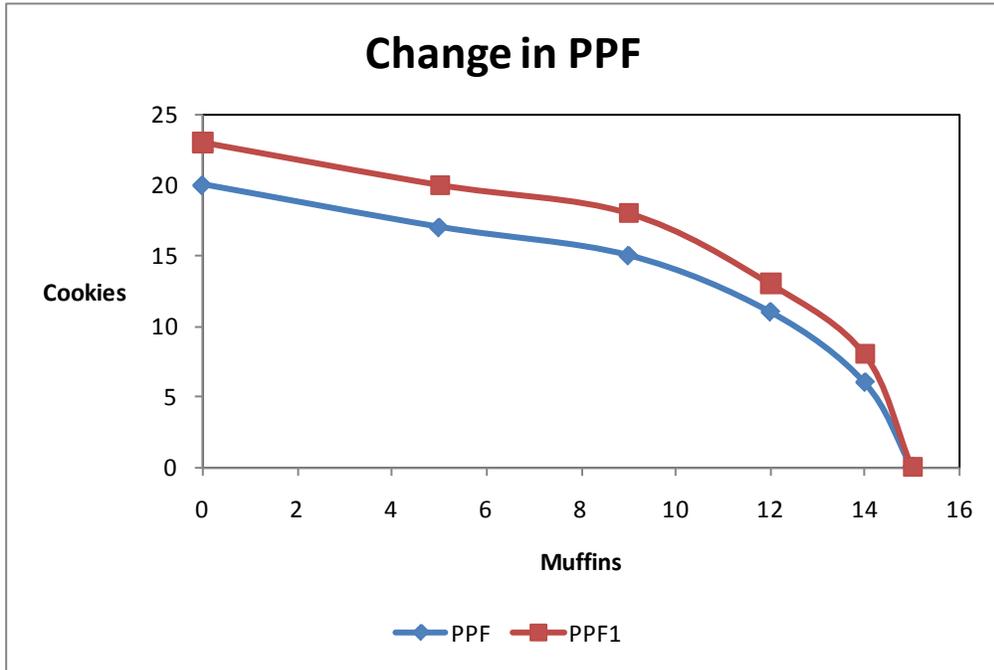
- a. Graph the Production Possibility Frontier for Mrs. Smith and calculate the opportunity cost of **each** of the 13th and 14th muffins. If the PPF is not a straight line, explain why.



Going from 12 to 14, the opportunity cost is $5/2=2.5$.

The PPF is bowed out as more muffins are produced, presumably because Mrs. Smith becomes less productive in making cookies the more she makes. Lots of possible reasons for this increasing opportunity cost.

- b. To remedy the poor performance of her oven, Ms. Smith begins using a better quality of flour for cookies. How do these actions affect her Production Possibility Frontier? Explain and re-draw.

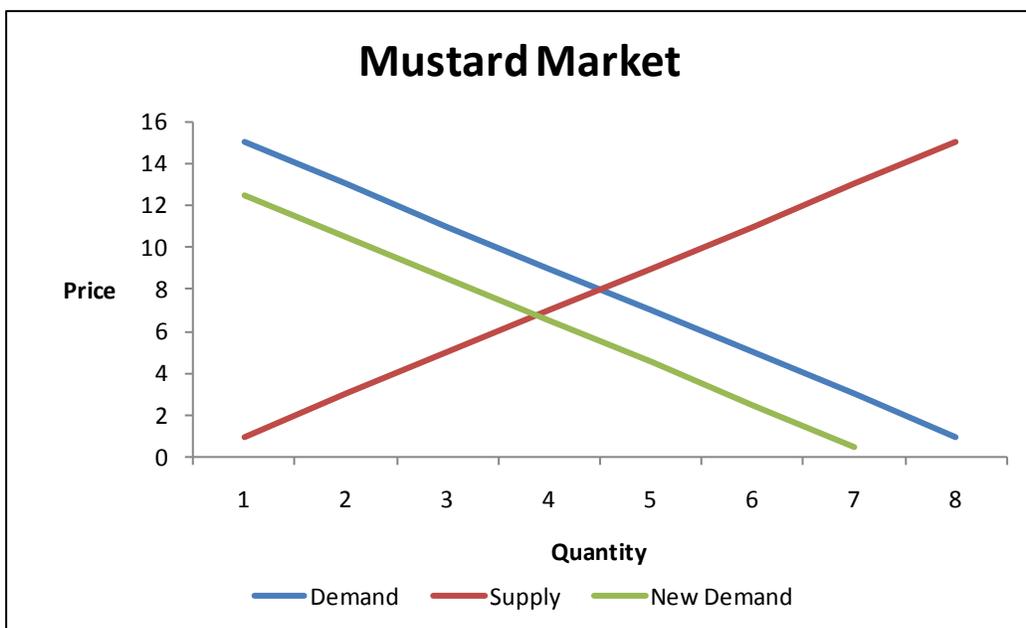


This is a technical improvement only in her ability to make cookies. So the PPF slides out along the Cookies axis, doesn't move along the Muffins axis.

II. (3 points each)

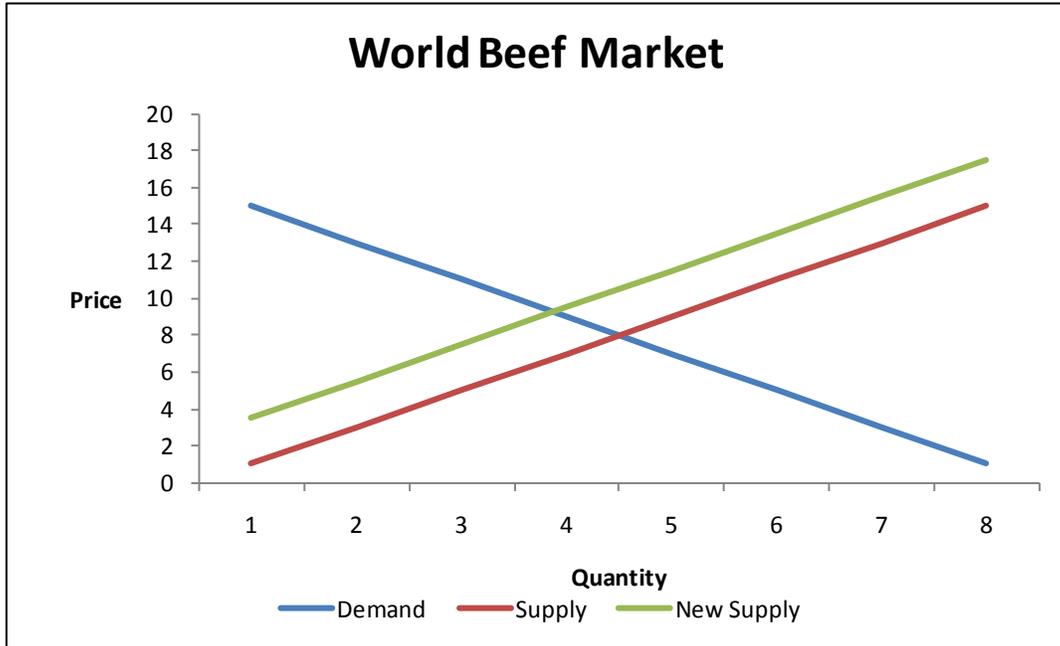
Use a supply and demand diagram to illustrate and explain the effect of the given shock or shocks on the equilibrium price and quantity in each competitive market.

- a. An advertisement for a new healthy snack causes consumers' tastes to shift away from hotdogs. Graph the effect on the market for mustard, which is used mainly when people eat hotdogs.



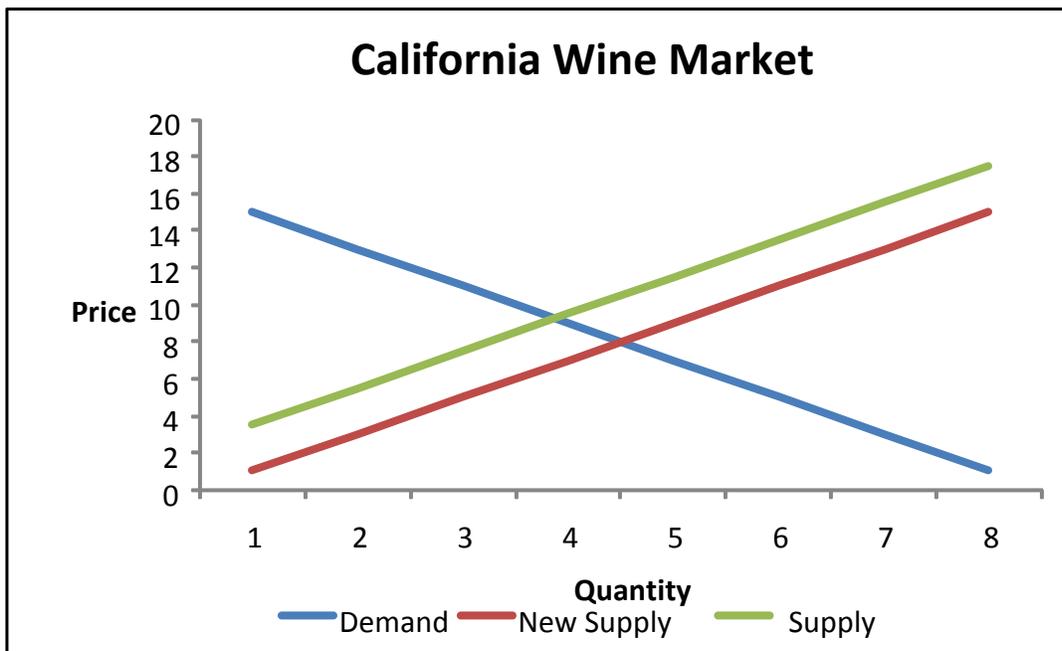
The shift of preferences away from hotdogs decreases demand for hotdogs. Since hotdogs and mustard are complements, the same thing happens in the mustard market. So both P^* and Q^* decrease.

- b. Argentina is currently the third largest beef exporter in the world. The Argentine government decides to restrict beef exports to keep domestic prices low. Show the effect of this policy on the world beef market.



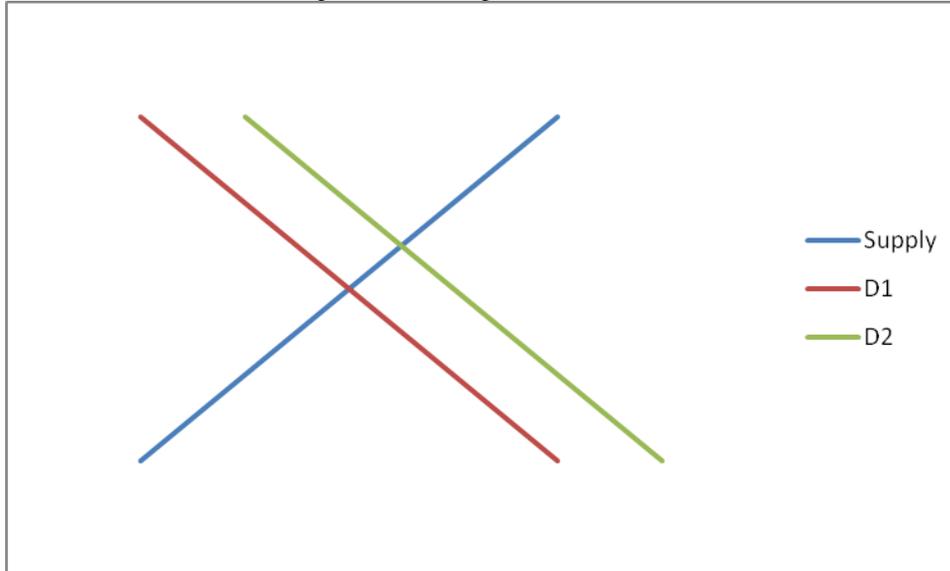
This restriction reduces the supply of Argentine beef to the world market, raising P^* and reducing Q^* on the world market.

- a. Gov. Schwarzenegger announces that the State of California will begin subsidizing the production of oak barrels, which are used in the wine industry. Show the effect that eventually will occur in the market for wine in California.



This subsidy lowers the cost of an input into wine-making, thus shifting the supply of wine to the right. This raises Q^* , lowers P^*

- b. Diatomaceous earth (DE) is used in pool filters. After a large amount of debris is picked up by the filter, new DE must be added back in. Illustrate what happens in the market for DE after a particularly bad rainstorm that puts debris in pools all over North America.



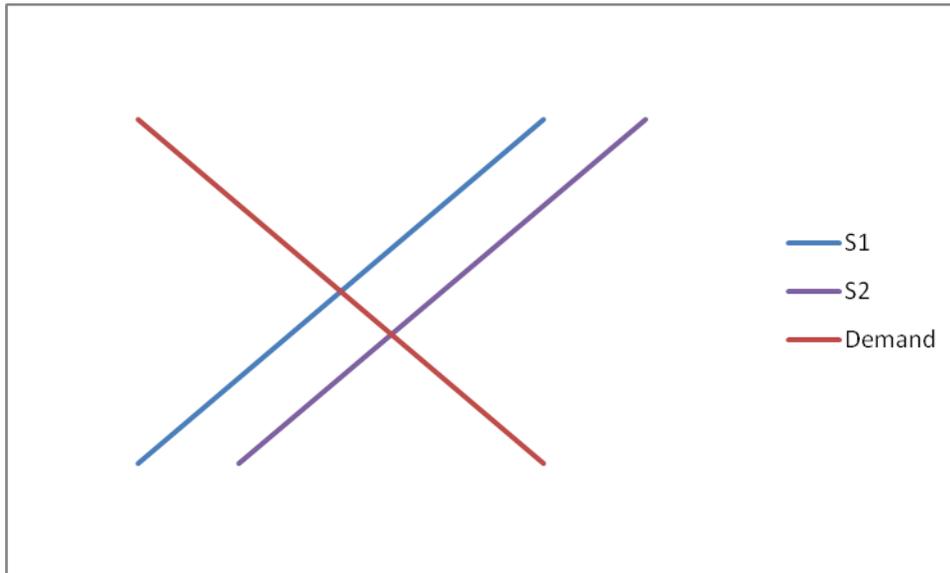
The rainstorm causes an increase in the demand for DE. Shifting the demand curve to the right; that increases both the equilibrium price and quantity.

III. (6 points)

Consider the seashell market in Port Aransas. Seashell sellers collect shells from the beach to sell in their stores.

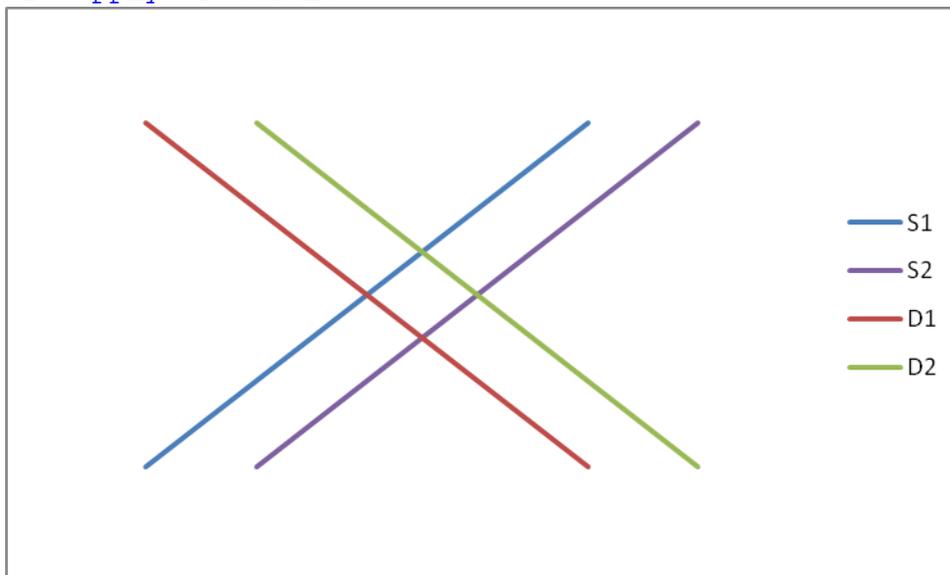
- a. Suppose a big hurricane hits Port Aransas, washing up many more shells on the beach. What happens to the equilibrium price and quantity in the seashell market? Use a graph to explain your answer.

The equilibrium price decreases since the supply shifts right and since the demand is downward sloping. The equilibrium quantity increases since the supply shifts right.



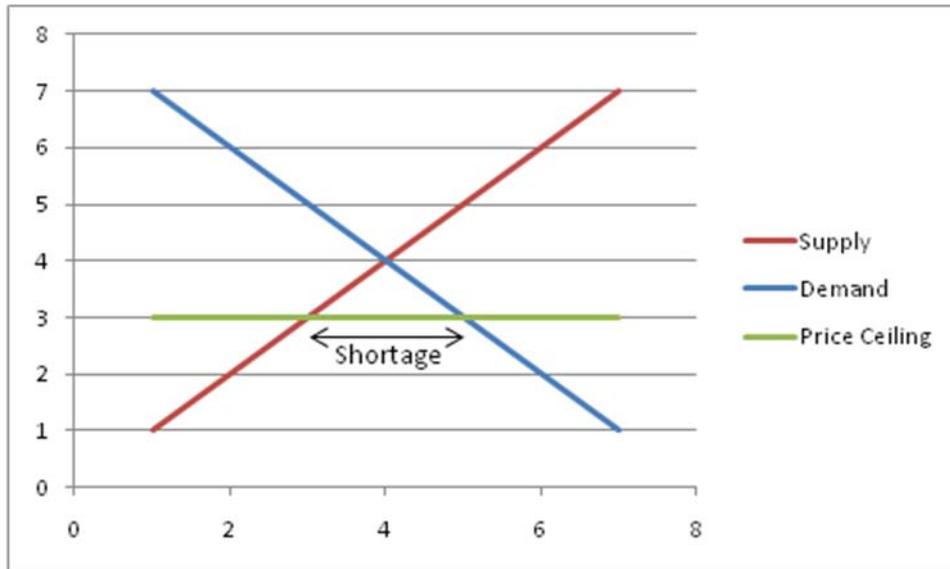
b. Now suppose that, in addition to the hurricane, shell jewelry becomes very popular. From the initial equilibrium, what can you say about the new equilibrium price and quantity? Use a new graph to explain your answer.

The equilibrium quantity will increase since both the supply and demand shift right. However, we cannot determine if the price will increase, decrease, or stay the same. This is because we don't know the exact shift in supply or demand and we don't know the elasticity of supply or demand.



c. The city of Port Aransas enacts a new law that caps the price of seashells at \$3. If the equilibrium price is currently \$4, what problem would occur? Illustrate this situation with a graph.

There will be a shortage (quantity demanded > quantity supplied) since the price ceiling is lower than the equilibrium price.



IV. (5 points)

Ralph sells breakfast tacos for \$2 each and beer for \$3/can out of a trailer on South Congress.

a. Mark is a customer of Ralph's trailer and buys 4 tacos each morning at the current price. If Ralph were to raise the price of a taco by 50%, Mark would buy only 2 tacos. What is Mark's elasticity of demand for tacos? Is his demand elastic or inelastic?

Elasticity = % Ch. in Q / % Ch. in P. The denominator is just 1/2, the 50% increase in P. The numerator is $2/.5 \cdot [4+2] = 2/3$, so the elasticity is the ratio of 2/3 divided by 1/2, or 4/3. The demand is elasticity

b. Assuming Mark is a typical buyer, should Ralph raise the price of his tacos?

Since the demand is elastic, an increase in price reduces total revenue. Ralph should not raise the price.

c. Suppose that Ralph does increase the price of a taco by 50%. Mark reduces his consumption of beer from 4 cans to 2 cans. Are tacos and beer complements or substitutes for Mark?

The demand for beer goes down when the price of tacos goes up, thus tacos and beer are compliments for Mark.

V. (2 points)

Laura loves to buy any new fashionable clothing. Every time her income rises she spends 1/3 of it on clothing. Her income is \$10,000 and she purchases 100 clothing items. If her income rises to \$11,000 and she buys 110 clothing items, what is her income elasticity of demand? Explain why? Is clothing a luxury, a necessity or inferior?

The 10 percent rise in income increases her quantity demanded by 10 percent, so her income elasticity of demand for clothing is +1. Clothing

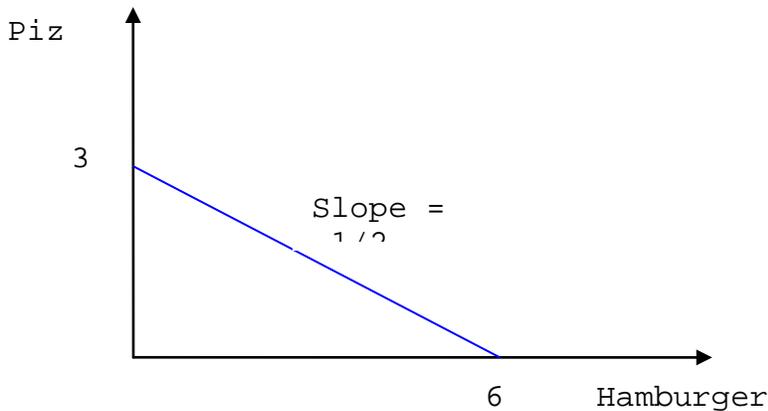
is neither a luxury nor a necessity—it's right in between.

VI. (5 points)

I have a budget of \$18 for lunch. I can either buy pizzas or hamburgers. The price of one pizza is \$6, and the price of one hamburger is \$3.

a. Draw the budget line that I face at lunch.

Budget Line: $6P + 3H = 18$



b. The table below shows my **total utility** (in money terms) for consuming different quantities of pizzas and hamburgers. How many pizzas and hamburgers should I buy if I want to maximize my utility? Explain your reasoning.

Quantity	1	2	3	4	5
Total Utility Pizzas	9	15	18	20	21
Total Utility Hamburgers	7	13	18	22	22.5

To maximize utility, the ratio of the marginal utilities from each good is equated to the ratio of the prices of the two goods. That can't be done; but if you spend the first \$3 on H, then the next \$3 on H, then the next \$3 on H, then the next \$6 on P, and the final \$3 of your \$18 on H, you will be getting the most utility per \$. 4H and 1P will maximize utility and spend the \$18 income.

Q	Total Utility P	Total Utility H	Marginal Utility P	Marginal Utility H
1	9	7	9	7
2	15	13	6	6
3	18	18	3	5
4	20	22	2	4
5	21	22.5	1	0.5

NAME AND UTEID

ECONOMICS 304K, FALL 2009

MIDTERM EXAM #2

D. Hamermesh

Answer the essay questions in the space provided on the test sheet or on the reverse side, and the multiple choice questions on the scantron and on the test sheet. **Write your name and UTEID on each page of the essay questions, and code your name and UTEID on the scantron.** You have 80 minutes for the exam, and there are 36 total points, with questions listed on SIX SEPARATE PAGES. Suggested answers will be posted on the website on Sunday, and tests will be handed back in class next Tuesday, November 3. In the meantime, please begin the readings for next week.

I. Short-answer Questions

1. (7 points) A typical firm in a competitive industry has costs as shown in the table. (Marginal cost is constant between $Q=0$ and $Q=10$, then between $Q=10$ and $Q=20$, etc.)

Output (Q)	Marginal Cost (MC)	Average Variable Cost (AVC)	Average Total Cost (ATC)
0	----	----	----
10		10	50
20		25	45
30		40	53.3
40		50	60

a. What are this firm's total fixed costs? What is its marginal cost at each output? Show your work.

b. If the market price is \$75, what will be this firm's output and profits? Explain

c. Will firms be entering or exiting this industry? Explain.

d. If the ATC listed above becomes the long-run average cost for firms in this industry, and the outputs listed are the only possible ones, what will be the equilibrium price? How much will the typical firm produce?

NAME AND UTEID

2. (6 points)

A publisher faces the following demand schedule for the next novel by one of her popular authors. The author is paid \$2 million to write the book, and the marginal cost of publishing the book is a constant \$15 per book.

PRICE	QUANTITY DEMANDED	TOTAL REVENUE	MARGINAL REVENUE
\$70	0		
60	100,000		
50	200,000		
40	300,000		
30	400,000		
20	500,000		

a. Compute total revenue and marginal revenue at each quantity.

b. What quantity will the profit-maximizing publisher choose? What price would she charge?

c. If the author insists on receiving \$6 million instead of \$2 million to write the book, how would this affect the publisher's profits and her decision about whether to publish the book, its price and quantity, and why?

NAME AND UTEID

3. (6 points)

Davy Jones and Jack Sparrow have met in the ocean. Both pirates have a stash of rum. The pirates are choosing whether or not to fire on the other, to try and steal the other pirate's rum. The outcomes of the situation are described as follows:

		Davy Jones	
		Fire Cannons	Don't Fire
Jack Sparrow	Fire Cannons	(-5, -5)	(15,-10)
	Don't Fire	(-10, 15)	(8, 8)

a. Is there a dominant strategy for either player? If so, what is it? Explain your answer.

b. What is the Nash equilibrium in this game? Explain your answer.

c. Is the outcome of the game Pareto optimal? Explain your answer.

II. Multiple-choice Questions

1. “Too many cooks spoil the broth” implies that the marginal product of the last cook is:
 - a. Very low.
 - b. Zero.
 - c. Negative.
 - d. Can only tell that the average cost is negative, can’t tell about the marginal product.
 - e. Both c and d.
2. As production increases in a typical firm:
 - a. Total fixed cost increases at a constant rate.
 - b. Average fixed cost exceeds average variable cost.
 - c. Average variable cost decreases and approaches zero.
 - d. Average variable cost approaches average total cost.
 - e. None of the above.
3. A positive **economic** profit occurs when a firm:
 - a. Earns normal returns.
 - b. Earns above-normal returns.
 - c. Continues its production.
 - d. Total revenue equals total cost.
 - e. b and d.
4. Variable inputs are those inputs:
 - a. That depend on the level of production.
 - b. That are cheap enough to own rather than lease.
 - c. In which diminishing returns do not occur in short run.
 - d. That can be stored for less than one year.
 - e. c and d.
5. Which of the following is true for production in the short-run?
 - a. Average product will be at its maximum when marginal product is at the maximum.
 - b. Average product will be at its maximum when marginal product is zero.
 - c. Average product will be at its maximum when marginal product equals average product.
 - d. Average product never reaches a maximum.
 - e. Average product is negative when marginal product is negative.
6. A firm has chosen its profit maximizing level of output. At this level of output, its price is \$20 and its ATC is \$25. The firm:
 - a. Has made a mistake; it should have shut down
 - b. Making a loss of \$20 per unit of output
 - c. Making a profit of \$5 per unit of output
 - d. Is OK if AVC is less than \$20
 - e. None of the above
7. Chile has decreased copper exports, and that reduced the supply of copper worldwide. Assuming copper is the main input into producing electronic devices, which is a competitive industry, what will occur in the electronic devices industry?
 - a. Since it is extremely difficult to exit the industry, no companies will leave.
 - b. Increased profits will cause new firms to enter the industry.
 - c. Some companies will restrict production in order to manipulate the output price.
 - d. Many companies will move to Chile to be closer to the input.
 - e. Decreased profits will cause firms to exit the industry.

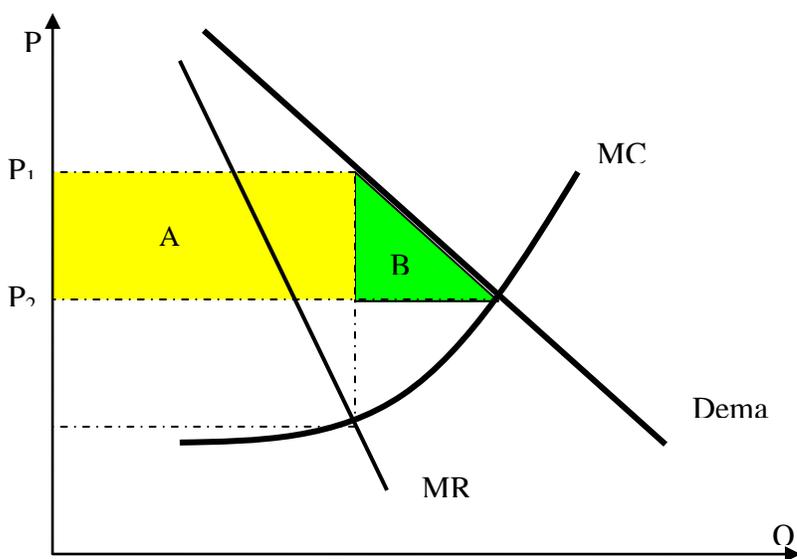
8. In a competitive industry in the long run:

- a. $P=LRMC$
- b. Each firm is earning the maximum profits possible.
- c. $P=\text{minimum LRAC}$
- d. a and b.
- e. All of the above

9. In the long run under perfect competition, accounting profits are positive. Choose the answer that best explains this statement. (Note: The firm also has other business opportunities).

- a. False, in the long run accounting profits must be zero.
- b. True if economic profits = 0, since accounting profits = economic profits + opportunity cost.
- c. True if economic profits > 0, since accounting profits = economic profits - opportunity cost.
- d. True if economic profits = 0, since accounting profits = economic profits + marginal cost.
- e. False; in the short run accounting profits must be zero.

10. The graph below illustrates the production decision of a monopoly. Which of the following statements is true?



- a. The consumer surplus under monopoly is B
- b. The deadweight loss is A+B
- c. P_2 is the monopoly price
- d. Monopoly makes a profit of A.
- e. Both b and d

11. If publishers need to pay the considerable fixed costs, few books would ever get published without copyrights, because:

- a. Absent copyrights, the reader is not willing to pay for the book.
- b. The marginal cost to the publisher is very high.
- c. Competition would drive the price down to marginal cost.
- d. Without copyrights, the price would be so high that no one could afford to buy the book.
- e. None of the above.

12. Book publishers sell hardback and paperback editions of the same book. Hardback books are issued first and are sold at a far higher price than the paperback edition, which is not made available until at least six months later. Which of the statements is true?

- a. Book publishers can charge every potential buyer of a book a different price.
- b. The seller charges those customers who have an elastic demand a higher price.
- c. The seller charges those customers who have an inelastic demand a higher price.
- d. The seller engages in first-degree price discrimination.
- e. None of the above

13. If there are only two industries in an economy, one competitive (C) and one monopolized (M), we will find:

- a. Too many resources in C and $\text{Price} > \text{Marginal Cost}$ in C.
- b. Too many resources in M and $\text{Price} > \text{Marginal Cost}$ in M.
- c. Too few resources in C and $\text{Price} < \text{Marginal Cost}$ in C.
- d. Too few resources in M and $\text{Price} > \text{Marginal Cost}$ in M.
- e. Both b and c.

14. The following statements are true for BOTH perfectly competitive and monopolistically competitive markets

EXCEPT:

- a. no long-run economic profits.
- b. some control over the price.
- c. many sellers.
- d. many buyers.
- e. no barriers to market entry or exit.

15. The auto industry is an example of a/an:

- a. oligopoly.
- b. monopoly.
- c. perfectly competitive market.
- d. monopolistically competitive market.
- e. cartel.

16. Telephone and airline deregulation:

- a. Ended cross-subsidies.
- b. Raised prices paid by the consumer.
- c. Reduced competition by ending subsidies to inefficient producers.
- d. b and c.
- e. All of the above.

17. Comparing government granting licenses to operate TV stations to its auctioning off those licenses:

- a. Both lead to the most efficient producer obtaining the license.
- b. Granting licenses leads to more efficient production, but doesn't generate any revenue for the government.
- c. Granting licenses leads to less efficient production and doesn't generate any revenue for the government.
- d. Neither leads to the most efficient producer obtaining the license.
- e. Granting licenses leads to more efficient production, and generates more revenue for the government.

NAME AND UTEID

ECONOMICS 304K, FALL 2009

MIDTERM EXAM #2

D. Hamermesh

Answer the essay questions in the space provided on the test sheet or on the reverse side, and the multiple choice questions on the scantron and on the test sheet. **Write your name and UTEID on each page of the essay questions, and code your name and UTEID on the scantron.** You have 80 minutes for the exam, and there are 36 total points. Suggested answers will be posted on the website on Sunday, and tests will be handed back in class next Tuesday, November 3. In the meantime, please begin the readings for next week.

I. Short-answer Questions

1. (7 points) A typical firm in a competitive industry has costs as shown in the table. (Marginal cost is constant between $Q=0$ and $Q=10$, then between $Q=10$ and $Q=20$, etc.)

Output (Q)	Marginal Cost (MC)	Average Variable Cost (AVC)	Average Total Cost (ATC)
0	----	----	----
10	10	10	50
20	40	25	45
30	70	40	53.3
40	80	50	60

a. What are this firm's total fixed costs? What is its marginal cost at each output? Show your work.

$FC = (ATC - AVC) * Q = (50 - 10) * 10 = 400$ (Note that any of the output quantities with respective AVC and ATC can be chosen to obtain the same answer)

$MC = \Delta ATC / \Delta Q = \Delta (ATC * Q) / \Delta Q$ (The total cost at an output of zero is just the fixed cost calculated above. The total cost calculation should have yielded [400, 500, 900, 1600, 2400])

Alternatively, $MC = \Delta AVC / \Delta Q = \Delta (AVC * Q) / \Delta Q$ (The variable cost at an output of zero is zero. The variable cost calculation should have yielded [0, 100, 500, 1200, 2000])

b. If the market price is \$75, what will be this firm's output and profits? Explain

The firm will produce the 30th unit since the MC for the 30th unit is $70 < 75$; however the 31st unit will not be produced since the MC for the 31st unit is $80 > 75$.

So the output will be 30 units and the profit will be $(P - ATC) * Q = (75 - 53.3) * 30 = 650$.

c. Will firms be entering or exiting this industry? Explain.

Seeing positive economic profits, other firms will enter this industry.

d. If the ATC listed above becomes the long-run average cost for firms in this industry, and the outputs listed are the only possible ones, what will be the equilibrium price? How much will the typical firm produce?

In the long-run, firms must produce at the lowest average total cost which is 45 per unit at an output of 20 units. Every firm must also have zero economic profits in the long-run so $(P - ATC) * Q = 0$ implying $P = ATC = 45$.

2. (6 points)

A publisher faces the following demand schedule for the next novel by one of her popular authors. The author is paid \$2 million to write the book, and the marginal cost of publishing the book is a constant \$15 per book.

a. Compute total revenue and marginal revenue at each quantity.

PRICE	QUANTITY DEMANDED	TOTAL REVENUE	MARGINAL REVENUE
\$70	0	\$0	
60	100,000	6,000,000	\$60
50	200,000	10,000,000	40
40	300,000	12,000,000	20
30	400,000	12,000,000	0
20	500,000	10,000,000	-20

b. What quantity will the profit-maximizing publisher choose? What price would she charge?

The publisher will choose the quantity where $MR=20 > 15=MC$, so the quantity is 300,000 and the price is \$40.

c. If the author insists on receiving \$6 million instead of \$2 million to write the book, how would this affect the publisher's profits and her decision about whether to publish the book, its price and quantity, and why?

*If the author is paid \$2 million, the profit of the publisher is $300,000 * (\$40 - \$15) - \$2,000,000 = \5.5 million*

*If the author is paid \$6 million, the profit of the publisher is $300,000 * (\$40 - \$15) - \$6,000,000 = \1.5 million*

It will reduce the publisher's profit, but because $P > AVC$ (profits are actually still positive), this extra fixed cost doesn't alter the profit-maximizing quantity and price.

3. (6 points)

Davy Jones and Jack Sparrow have met in the ocean. Both pirates have a stash of rum. The pirates are choosing whether or not to fire on the other, to try and steal the other pirate's rum. The outcomes of the situation are described as follows:

		Davy Jones	
		Fire Cannons	Don't Fire
Jack Sparrow	Fire Cannons	(-5, -5)	(15, -10)
	Don't Fire	(-10, 15)	(8, 8)

a. Is there a dominant strategy for either player? If so, what is it? Explain your answer.

Jack Sparrow

		<i>Fire</i>		<i>No Fire</i>
	<i>-5</i>	>	<i>-10</i>	
	<i>15</i>	>	<i>8</i>	

Dominant Strategy: Fire

Davy Jones

		<i>Fire</i>		<i>No Fire</i>
	<i>-5</i>	>	<i>-10</i>	
	<i>15</i>	>	<i>8</i>	

Dominant Strategy: Fire

b. What is the Nash equilibrium in this game? Explain your answer.

Both pirates will play their own dominant strategy, so Jack Sparrow will fire and Davy Jones will also fire. Hence, the Nash equilibrium will be (-5,-5)

c. Is the outcome of the game Pareto optimal? Explain your answer.

*The outcome of the game is **NOT** Pareto optimal, both pirates will be better off if they don't fire on each other. The no fire, no fire outcome (8,8) is better for both than Fire outcome (-5,-5).*

II. Multiple-choice Questions

III.

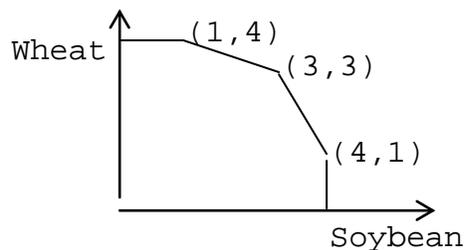
ANSWERS:

1-5	c	d	b	a	c
6-10	d	e	e	b	d
11-15	c	c	d	b	a
16-17	a	c			

Code the multiple-choice questions on the scantron, mark them on your test sheet and keep the test sheet.

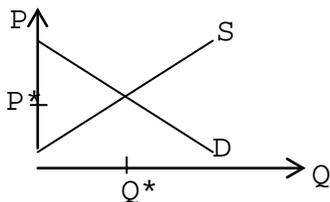
Please bubble in your name and UTEID on the scantron. You have 2-1/2 hours for this exam. There are only 72 questions, but each requires serious thought. Anyone who leaves the test before 1-1/2 hours of the 2-1/2 hour exam session is unlikely to have done very well. **Please leave an empty seat on both sides of your seat if possible.**

Exam answers will be posted on my website <http://www.eco.utexas.edu/faculty/Hamermesh/class.html> at Noon tomorrow. Grades will be on EGradebook no later than 5PM Wednesday, December 16. If you have any questions, please hold them until **after January 20. I can't respond to any inquiries about grades until then.**



1. If an economy faces the above PPF and initially produces equal amounts of wheat and soybeans, what is the opportunity cost of choosing to grow one more unit of soybeans?
 - a. 1 unit of soybeans
 - b. 1 unit of wheat
 - c. 2 units of soybeans
 - d. 2 units of wheat
 - e. None of the above
2. Suppose now that the low-carb diet fad decreases demand for wheat products. The economy's PPF will shift:
 - a. In on the wheat axis
 - b. Out on the soybean axis
 - c. Out on both axes
 - d. In on the soybean axis
 - e. None of the above
3. Opportunity cost is:
 - a. What must be given up to obtain more of a product or service.
 - b. The additional benefit of buying an additional unit of a product.
 - c. The cost incurred in the past before we make a decision about what to do in the future.
 - d. A cost that cannot be avoided, regardless of what is done in the future.
 - e. The cost of product that is on sale.
4. Microeconomics does **NOT** deal with:
 - a. Which orange juice you should buy.
 - b. The price at which a producer should sell his output.
 - c. An increase in the rate of inflation.
 - d. How much business is willing to hire and at what wage.
 - e. The vacations plan of a family.

5. Most reviewers said that *New Moon* was better than its predecessor. What do you expect these reviews to do to the market for *New Moon*?
- The ticket price rises, causing the quantity of tickets demanded to decrease.
 - The demand and the supply curves shift outward, causing equilibrium quantity to go up.
 - The demand curve shifts outward, causing equilibrium price to go up.
 - The demand and the supply curve are not affected.
 - The supply curve shifts inward, causing equilibrium price and quantity to rise.
6. California is a major producer of grapes used in wine production. An unexpected wildfire in California destroys some of the grapes. What happens in the market for wine?
- Demand for wine decreases. Price increases and the effect on quantity is ambiguous.
 - Supply of wine decreases. Price increases and quantity decreases.
 - Demand and supply decrease. Price increases and quantity decreases.
 - Supply of wine increases. Price decreases and quantity increases.
 - Demand for wine increases. Price decreases and quantity increases.
7. An electronics company gives a 50% rebate on the price of its best product. What effect will you see on the demand side?
- Increase in demand.
 - Decrease in demand.
 - Decrease in quantity demanded.
 - Increase in quantity demanded.
 - Depends on movement on the supply side.



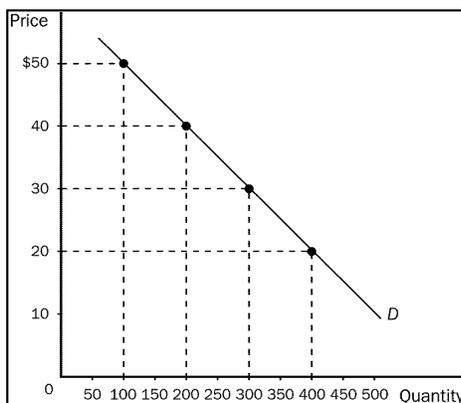
8. The market for accountants in Austin today is represented by the Figure above. In April there is a temporary increase in new customers who want help with their taxes. What does the equilibrium look like in April?
- Demand shifts out, so P^* and Q^* are both higher.
 - Demand and supply shift out, so Q^* is higher.
 - Demand and supply shift out, so Q^* and P^* are higher.
 - Demand shifts out, so P^* is higher.
 - None of the above.

Price of coffee	Quantity Demanded	Quantity Supplied
\$ 1	15,000	1000
\$ 2	10,000	4000
\$ 3	5000	5000
\$ 4	1500	6500
\$ 5	500	8000

9. UT wants more productive students, so it fixes the price of coffee at \$2 per cup. In the coffee market there will be:
- Equilibrium.
 - A shortage of 5000 cups.
 - A surplus of 5000 cups.
 - A shortage of 6000 cups.
 - A surplus of 6000 cups.

10. Consider the market for bread and butter, which are complements. Suppose that these markets are perfectly competitive and are in equilibrium. Suddenly, improved technology increases the supply of butter.
- The price of butter falls and the quantity demanded of bread increases.
 - The price of bread rises and the quantity demanded of bread increases.
 - Both the price of bread and the quantity demanded of bread decrease.
 - Both the price of bread and the demand for butter decrease.
 - None is correct.

11. In Austin the price elasticity of demand for used cars is $1/3$. This means that a **25 percent increase** in the quantity of used cars demanded was caused by the following change in the price of used cars:
- Increase by approximately 75 percent.
 - Decrease by approximately 75 percent.
 - Decrease by approximately 25 percent.
 - Decrease by approximately 50 percent.
 - None of the above.



12. When price falls from \$40 to \$30 in the Figure above, we know that demand must be:
- Elastic, since total revenue increases from \$8000 to \$9000.
 - Inelastic, since total revenue increases from \$8000 to \$9000.
 - Inelastic, since total revenue decreases from \$9000 to \$8000.
 - Unit elastic, since total revenue decreases from \$9000 to \$8000.
 - Unit elastic, since revenue stays the same
13. In the holiday season, people “have to” buy toys and gifts for loved ones. People’s demand curves become more _____; firms supplying such items will _____ prices to maximize profits.
- Inelastic, decrease
 - Elastic, increase
 - Inelastic, increase
 - Elastic, decrease
 - None of the above.
14. Randy goes out to night clubs frequently. If the entrance charge went down by 10% or his income went up by 20%, he would go to clubs 15% more. What kinds of good would we define night clubs to be for Randy?
- Inelastic and a luxury good.
 - Elastic and an inferior good.
 - Elastic and a luxury good.
 - Inelastic and a necessity.
 - Elastic and a necessity.

15. Mr. Thomas spends his entire income on food and books. He always spends $\frac{3}{4}$ of his income on food. His demand for books has an income elasticity of:
- 0
 - $\frac{3}{4}$
 - 1
 - Not enough information to answer the question.
 - None is correct.
16. Each day Peter must drink one cup of coffee. He pays \$1 for a medium coffee at his local coffee shop. One day last week, the shop was closed for inventory, so Peter bought a medium coffee at Starbucks for \$3. What do we know about Peter's consumer surplus at the local shop?
- Nothing; just that he'd rather not drink Starbucks
 - It is less than \$2
 - It is exactly \$2
 - It is at least \$2
 - None of the above
17. Charlie likes to watch tennis games and football games. An extra tennis game yields twice the utility of an extra football game. The prices of watching the tennis and football games are \$4 and \$8 respectively.
- The law of diminishing marginal utility tells that Charlie consumes more tennis games than football games.
 - Charlie should consume more football games and fewer tennis games to maximize utility.
 - The law of diminishing marginal utility tells that Charlie must be consuming more football games than tennis games.
 - Charlie should consume more tennis games and fewer football games to maximize utility.
 - a and b.
18. Suppose that a farmer invested \$1 million of his savings to open his farm. He could have deposited the money in a bank to earn \$40,000 a year in interest. In addition, he had to give up a job that paid him \$30,000 a year. At the end of the year, the revenue of the farm is \$170,000, and materials cost \$100,000. What is the economic profit of the farmer?
- \$70,000
 - \$50,000
 - \$30,000
 - \$0
 - None of the above
19. Which of the following is a firm most likely **NOT** able to adjust in the long run?
- Machines
 - Labor
 - Electricity
 - Buildings/Structures
 - None of the above
20. If Boeing produces 9 jets per month, its long-run total cost is \$9.0 million per month. If it produces 10 jets per month, its long-run total cost is \$9.5 million per month. Which of the following statements is true?
- Boeing exhibits economies of scale.
 - Boeing exhibits diseconomies of scale.
 - Boeing's long-run average total cost decreases as the quantity of output increases.
 - Boeing's long-run average total cost increases as the quantity of output increases.
 - a and c.

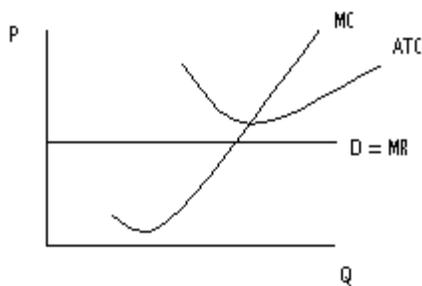
Use the following information on the costs of Hoopla, a perfectly competitive balloon-maker, to answer Question 25.

<u>Long-run Marginal Cost</u>	<u>Output Between</u>
\$.15	0 - 300 balloons
.10	300 - 600 balloons
.25	600 or more balloons

25. What will the price in the balloon market be in the long run?
- The market price will be \$.10 per balloon.
 - The market price will be between \$.10 and \$.15 per balloon.
 - The market price will be \$.15 per balloon.
 - The market price will be between \$.15 and \$.25 per balloon.
 - The market price cannot be determined with this information.

26. Under perfect competition, if Price > Marginal Cost in an industry, its output should be:

- Cut, because it is too expensive given the cost of production.
- Cut, because people don't value the output very much.
- Increased, because it is characterized by economies of scale.
- Increased, because people value it more than it costs.
- c and d.



27. In the Figure above, in the long run:

- Firms will enter, driving down the market price.
- Long-run economic profits will be less than 0.
- Firms face perfectly inelastic demand curves.
- The industry faces a perfectly elastic demand curve.
- Firms will exit, raising the market price.

28. Lady Gaga has 2 million fans, and Miley has 1 million fans. Which of the following would be a Pareto improvement?

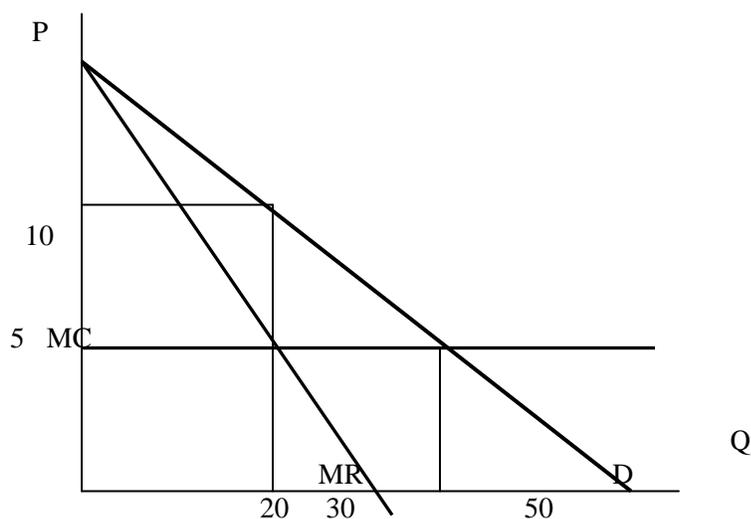
- Lady Gaga has 1.5 million fans, Miley has 1.5 million fans.
- Lady Gaga has 1.5 millions fans, Miley has 1 million fans.
- Lady Gaga has 2 million fans, Miley has 1.5 million fans.
- Lady Gaga has 1 million fans, Miley has 2 million fans.
- Lady Gaga has 2,000,001 fans, Miley has 999,999 fans.

29. Which of following statements is **NOT** an example of demand-based price discrimination?

- Movie theaters charge a lower price for children and senior citizens than for other patrons.
- Airlines charge a lower price for a round-trip ticket if the traveler stays over a Saturday night.
- Companies offer discount coupons to readers of the *National Inquirer*.
- A bakery charges \$0.50 for each donut, but \$5 for a dozen.
- Both a and c

30. Wilson, Penn, Dunlop, and Spalding make almost all the tennis balls sold in the U.S. How can we describe the market for tennis balls?
- Monopolized.
 - Perfectly competitive.
 - Oligopsony.
 - Monopolistic competition.
 - Oligopoly.

31. Which one of the following statements about monopoly and monopolistic competition is **NOT** correct?
- Monopolistically competitive firms have differentiated products.
 - Monopolies price at $P > ATC$ in the long run.
 - Monopolistically competitive firms are price takers.
 - Monopolies enjoy significant barriers to entry.
 - In the long run, monopolistically competitive firms earn a competitive profit.



32. Using this graph, what are the equilibrium price and quantity (P,Q) in a monopoly?
- (5, 30)
 - (10, 20)
 - (5, 20)
 - (20, 10)
 - None of the above

		S	N
A1	S	6, 3	1, 6
	N	3, 8	2, 7

33. In the above game, what is the Nash equilibrium, and is a Pareto improvement from that equilibrium possible?
- Nash is (N,S), a Pareto improvement is possible
 - Nash is (N,S), a Pareto improvement is not possible
 - Nash is (S,N), a Pareto improvement is not possible
 - Nash is (N,N), a Pareto improvement is possible
 - There is no Nash equilibrium

		Lady Gaga	
		Cute	Sex
Miley y	Cute	100; 10	50; 50
	Sexy	30; 50	20; 40

34. Miley's dominant strategy is to be _____, Lady Gaga's dominant strategy is to be _____; and a Nash equilibrium of this game is_____.
- Cute; Cute; {Cute, Cute}
 - Sexy; Sexy; {Sexy, Sexy}
 - Sexy; no dominant strategy; {Sexy, Cute}
 - Cute; no dominant strategy; {Cute, Sexy}
 - No dominant strategy; Cute; {Sexy, Cute}
35. In the United States, health expenditures as a percent of GDP have _____; _____ pay(s) the highest portion of the costs.
- decreased; patients
 - increased; government
 - remained roughly constant; private insurers
 - decreased; patients
 - increased; private insurers
36. What is **NOT** true about the Federal Insurance Contribution Act (FICA) tax?
- FICA is used for a transfer payment.
 - FICA is a progressive tax.
 - FICA is a regressive tax.
 - The amount of your paycheck that is taxed is always under 10% of wages.
 - FICA is used to fund Medicare.
37. Which of the following does **NOT** explain high salaries of professional athletes?
- Risk of injury.
 - Revenue sharing by athletic teams.
 - Long periods of training
 - Televising of pro sports.
 - b and c.
38. Using the "Rule of 70," how much time will it take Santa Claus to double his investment in Reindeer bonds if Reindeer bonds pay 5% monthly interest?
- 5 months
 - 14 months
 - 65 months
 - 70 months
 - 350 months
39. What is the present value of \$1,000 received in 3 years if the interest rate is 6%?
- \$847.46
 - \$1,180.00
 - \$1,191.02
 - \$1060.38
 - \$839.63

40. The table below describes the number of baseballs a manufacturer can produce per day with different quantities of labor. Each baseball sells for \$5, and each worker earns \$50 per day. Using this table, how many workers should the baseball manufacturer employ?

Workers	Baseballs Per Day
0	0
1	11
2	24
3	36
4	44
5	50

- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

41. In general, what can we say about the elasticity of labor demand for low-skilled workers and for high-skilled workers?

- a. The demand for low-skilled workers is perfectly elastic.
- b. The demand for high-skilled workers is perfectly inelastic.
- c. The demand for low-skilled workers is more elastic than for high-skilled workers.
- d. The demand for low-skilled workers is less elastic than for high-skilled workers.
- e. The demand for low-skilled workers has the same elasticity as for high-skilled workers.

42. If the price of an airline ticket falls, what will happen to the demand curve for flight attendants?

- a. It will shift to the left.
- b. It will shift to the right.
- c. The direction of the shift is ambiguous.
- d. It will not change.
- e. It will become steeper.

43. Differences in wages that result from differences in working conditions are known as:

- a. Occupational differentials.
- b. Competing differentials.
- c. Comparable worth.
- d. Compensating differentials.
- e. None of the above.

44. The rate of return to a year of college today averages around:

- a. 2 percent.
- b. 5 percent.
- c. 8 percent.
- d. 11 percent.
- e. 15 percent

45. Income inequality in the U.S. today is:

- a. Low compared to Northern Europe.
- b. High compared to developing countries.
- c. Slightly lower than in Japan.
- d. b and c.
- e. None of the above.

46. Consider the technological innovation of the internet and the ability to work remotely. We will find a _____ fraction of ugly than of good-looking employees working remotely through the internet, and their wages will be _____ those of ugly employees who do not work remotely through the internet.

- a. similar; the same as
- b. higher; higher than
- c. lower; higher than
- d. higher; lower than
- e. lower; lower than

47. The poverty rate in the U.S. today is around:

- a. 2 percent.
- b. 6 percent.
- c. 10 percent.
- d. 14 percent.
- e. 18 percent.

48. In the United States over the past 40 years the labor-force participation rate of males has _____, and the labor-force participation rate of women has _____.

- a. Fallen; risen.
- b. Risen; stayed constant.
- c. Stayed constant; stayed constant.
- d. Stayed constant; fallen.
- e. Stayed constant; risen.

49. Human capital theory predicts that:

- a. People are unlikely to learn skills late in life.
- b. At age 22 college grads may earn less than high-school grads.
- c. At age 50 college grads will earn much more than high-school grads.
- d. All of the above.
- e. a and c.

50. In the U. S. the Gini coefficient for income is less than that for wealth. This means income is distributed _____ equally than wealth, and the Lorenz curve for _____ lies further on average from the 45- degree line.

- a. more; income
- b. more; wealth
- c. less; income
- d. less; wealth
- e. less; the Gini coefficient

51. According to the Automation Reading you were assigned, which of the following is **NOT** an implication of the “lump of labor theory?”

- a. The number of jobs in U. S. falls if the minimum wage rises.
- b. Technological innovations increase unemployment.
- c. Immigrants take American jobs.
- d. One way to reduce unemployment would be to limit the hours of work for each individual.
- e. Government should encourage early retirement.

52. The gap in the wages between men and women in the U.S. can be explained at least partly by differences in which of the following?

- a. Experience.
- b. Education
- c. Occupational Choice.
- d. All of the above.
- e. a and c.

53. If your professor earns \$100,000 teaching introductory economics at UT, and he could teach elsewhere for only \$80,000:

- a. His true value to the University is \$80,000.
- b. His opportunity cost is \$100,000.
- c. He earns an economic rent of -\$20,000.
- d. He earns economic rent of \$20,000.
- e. Both b and d.

54. Which of the following is **LEAST LIKELY** to be a public good?

- a. Cable TV
- b. National defense
- c. A lighthouse
- d. An uncongested highway
- e. Music downloads from Napster

55. Which of the following is **NOT** an example of market failure?

- a. More expensive rental apartments in West Campus than in Round Rock.
- b. Collusion by OPEC.
- c. Beautiful flowers on Gwen's lawn enjoyed by her neighbors.
- d. Not knowing whether a car has been in an accident when car shopping.
- e. All are examples of market failure.

56. A positive externality in honey means that market forces would cause the demand for honey to be _____ the socially optimal amount. So the government should _____ honey production.

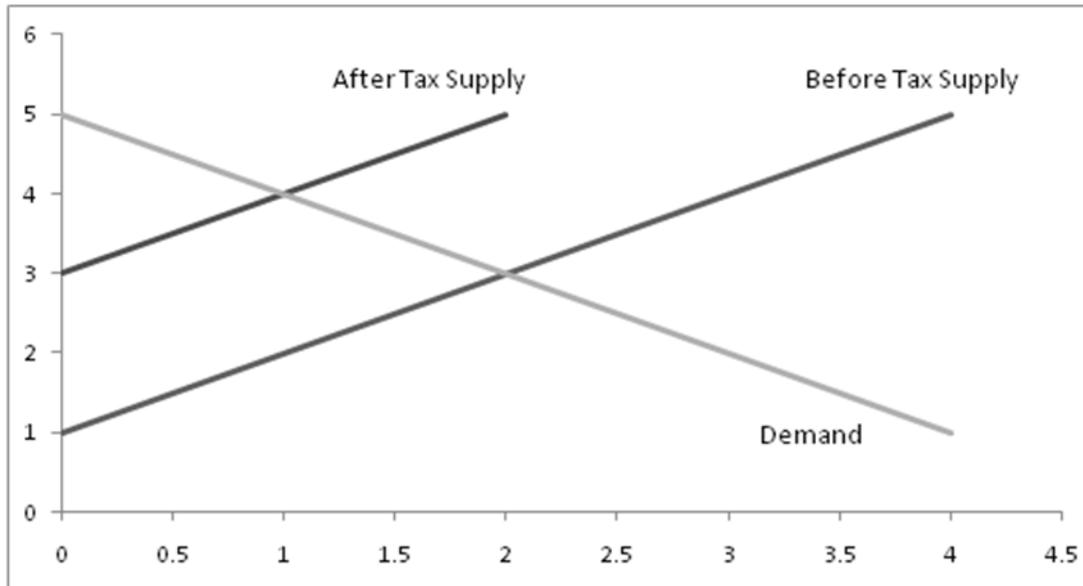
- a. less than; tax
- b. less than; subsidize
- c. the same as; neither tax nor subsidize
- d. more than; tax
- e. more than; subsidize

57. The optimal level of pollution is:

- a. Equal to zero.
- b. The level at which total costs of pollution are minimized.
- c. Where marginal pollution reduction costs equal marginal benefits.
- d. The level at which total benefits from pollution reduction are maximized.
- e. The level set by the Kyoto Protocol.

58. There may be failure in the market for used cars because of:

- a. Opportunity cost.
- b. Altruism.
- c. Elasticity of supply.
- d. Externalities.
- e. Asymmetric information.



59. What is the tax revenue in this Figure?

- a. 0
- b. 0.5
- c. 1
- d. 1.5
- e. 2

60. A tax on plastic surgeons performing elective plastic surgery will be:

- a. Borne by consumers if the demand is elastic.
- b. Regressive.
- c. Progressive.
- d. Progressive only if borne by producers.
- e. a and c.

61. Which answer best characterizes the following income tax schedule?

Income	Tax
\$20,000	\$4,000
\$35,000	\$9,000
\$55,000	\$17,000
\$75,000	\$27,000

- a. This is a regressive income tax.
- b. This is a neutral income tax.
- c. This is a progressive income tax.
- d. This is a proportional income tax.
- e. Need more information to classify this tax schedule.

62. Which of the following statements is **FALSE**?

- a. The estate tax accounts for more government revenue than the individual income tax.
- b. Social insurance taxes and individual income taxes account for nearly the same amount of revenue.
- c. Compared to other developed countries, the U.S. government is relatively small.
- d. The estate tax is progressive.
- e. a and b.

63. Which of the following does **NOT** cause an equalizing redistribution of income in the U.S.?
- The federal individual income tax.
 - Medicare and Medicaid.
 - The Social Security program.
 - Welfare programs.
 - State sales taxes.

Assume that China and the U.S. have work forces of exactly the same size. The total production of rice and shoes that is possible in each country is shown by the table below (e.g., if China devotes all its labor to shoes, it can produce 700 pairs of shoes, if it devotes all labor to rice, it produces 21,000 kg.).

	Shoes (in pairs)	Rice (in kilograms)
China	500	1,500
U.S.	100	1,000

64. Which of the following statements is **TRUE** about the information in this table?
- China's only absolute advantage is in shoe production.
 - The U.S. has a comparative advantage in shoe production.
 - The U.S. has a comparative advantage in rice production.
 - China has nothing to gain from trading with the U.S.
 - The U.S. will be hurt by trading with China.
65. If the U.S. decides to trade with China, based on this table we would expect:
- The U.S. to export shoes and import rice
 - The U.S. to import shoes and export rice
 - China to import both rice and shoes
 - China to export both rice and shoes
 - The wages of rice farmers in the U.S. to rise
66. Possible terms of trade of shoes for rice could be:
- 1 pair of shoes for 1 kg of rice
 - 1 pair of shoes for 1 kg of rice and the U.S. will be very happy
 - 1 pair of shoes for 3.5 kg of rice and the U.S. will be very happy
 - 1 pair of shoes for 9.5 kg of rice and the U.S. will be very happy
 - 1 pair of shoes for 20 kg of rice
67. France has a comparative advantage over the United States in producing fine wines. If France and the United States trade:
- Everyone will benefit.
 - U. S. producers of fine wine will increase production.
 - French producers will seek tariff protection.
 - Fine wine prices will rise in France.
 - U. S. consumers will be hurt.
68. Which of the following statements is **TRUE**?
- Free trade benefits a country when it exports but harms it when it imports.
 - Tariffs and quotas make the average person in society better off.
 - A country cannot have a comparative advantage in producing a good if it doesn't have an absolute advantage in it.
 - Trade among nations is based on absolute advantage.
 - Trade restrictions help people in the protected industry.

69. A trade quota _____ consumers and _____ producers and their employees.
- hurts; helps
 - helps; hurts
 - hurts; hurts
 - hurts; has no effect on
 - has no effect on; helps
70. You get to the concert and find your ticket is lost, but other tickets are available for purchase at the same price. If you are rational you will:
- Buy a replacement ticket.
 - Go home and do something else.
 - Buy a ticket for a cheaper seat.
 - Buy a ticket for a more expensive seat.
 - Impose externalities on your neighbors.
71. Somebody vomiting in the water next to the snorkeling boat and attracting tropical fish is an example of a:
- Pareto improvement.
 - Pareto inferiorum.
 - Positive externality.
 - Negative externality.
 - Negative internality.
72. A 50" flat-screen television was priced at \$8,000 in 2004. In 2009 a good 50" plasma television cost only a bit more than \$1,500. What is the possible reason?
- Increased competition has driven the price down.
 - Marginal cost has risen by less than average variable cost has decreased.
 - As companies produce more, they can take advantage of economies of scale.
 - The short-run average cost curve is decreasing.
 - a and c.

ANSWERS

QUESTION	1	2	3	4	5	6	7	8	9	0
1-10	d	e	a	c	c	b	d	a	d	e
11-20	b	a	c	e	c	d	d	d	e	e
21-30	b	c	d	a	b	d	e	c	d	e
31-40	c	b	e	d	e	b	b	b	e	c
41-50	c	b	d	d	e	b	d	a	d	b
51-60	a	e	d	a	a	b	c	e	e	c
61-70	c	a	e	c	b	c	d	e	a	a
71-72	c	e								

COURSE GRADE DISTRIBUTION

GRADE	PERCENT
A	14
B	38
C	33
D	14
F	1

Two students received an A grade because they hit the "Hammer Homer"

Regarding +/- grades: Within each of the B, C and D ranges, the top $\frac{1}{4}$ of students in the range got a +, the bottom $\frac{1}{4}$ of students got a -, the remaining $\frac{1}{2}$ got the straight grade.

In the A range, the top 2 percent of students in the course got an A+ in my gradebook (though I can't record that as an official grade), the bottom $\frac{1}{4}$ of students in the A range got an A-, the remainder got the straight A grade.

FINAL EXAM CUT-OFFS

GRADE	SCORE
A	52
B	45
C	38
D	32

The top score on the final exam was 62 (3 people), the bottom score was 19, the average was 45.