

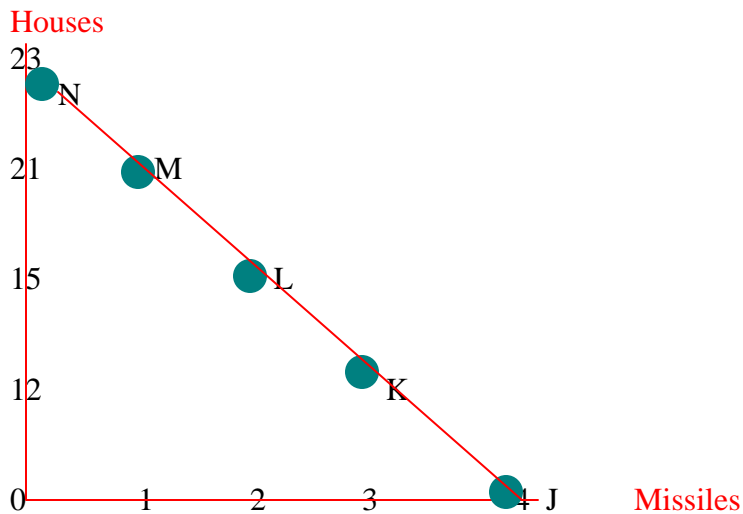
Econ 170: Contemporary Economics
Spring 2008
Exam 1 / Section F: SOLUTIONS

1. Production possibilities and opportunity costs of missiles and houses

The table below shows the tradeoff between different combinations of missile production and home construction, *ceteris paribus*.

Combination	Number of houses	Number of missiles
J	0	4
K	12	3
L	15	2
M	21	1
N	23	0

- a. Draw the production possibilities curve illustrating the possible combinations of missiles and houses. Please remember to label all parts of your graph.



- b. What is the opportunity cost of moving from point K to point J, in terms of houses?

12 houses

2. Demand and supply for trucks (millions of trucks per year)

Price (per truck)	<u>Quantity Demanded By</u>		
	Americans	Rest of the World	Worldwide Market
\$50,000	10	20	<u>30</u>
40,000	20	40	<u>60</u>
30,000	40	80	<u>120</u>
20,000	80	120	<u>200</u>

Price (per truck)	<u>Quantity Supplied By</u>		
	Americans	Rest of the World	Worldwide Market
\$50,000	80	120	<u>200</u>
40,000	60	100	<u>160</u>
30,000	40	80	<u>120</u>
20,000	30	10	<u>40</u>

- 2a. In the table above, if the worldwide price of trucks is \$30,000, the truck market: **Is in equilibrium.**
- 2b. In the table above, if the worldwide price of trucks is \$40,000, the truck market: **Experiences a surplus of 100 million trucks per year.**
- 2c. In the table above, if the worldwide price of trucks is \$20,000, the truck market: **Experiences a shortage of 160 million trucks per year.**
- 2d. In the table above, the equilibrium price in the worldwide truck market is: **\$30,000.**
- 2e. In the table above, the equilibrium quantity in the worldwide truck market is: **120 million trucks per year.**

3. Utility schedule

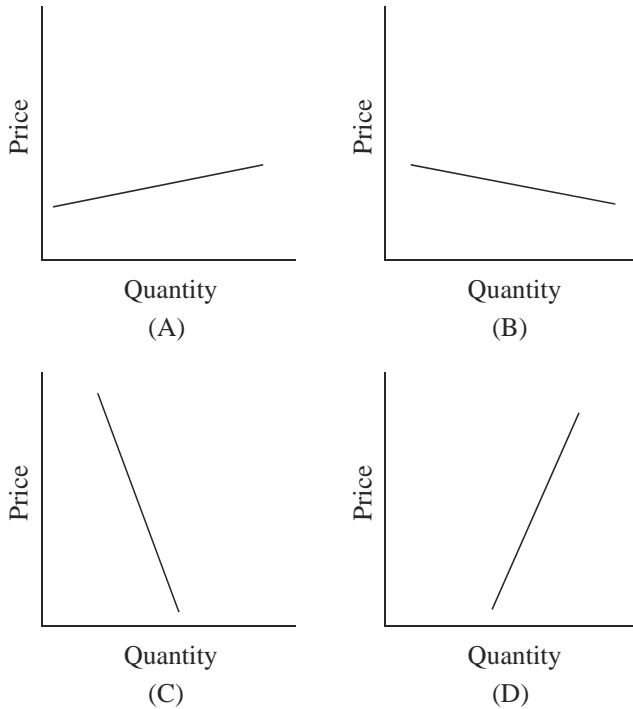
a. Complete the table.

<u>Quantity consumed</u>	<u>Total utility</u>	<u>Marginal utility</u>
1	25	25
2	47	22
3	60	13
4	65	5

b. Explain (briefly) why MU is diminishing as quantity consumed increases.

Law of diminishing marginal utility – as quantity consumed increases, each additional unit provides less utility (satisfaction) than the previous unit.

4. Price elasticity of demand



4a. In the above figure, the price elasticity of demand in Graph B is: **Relatively elastic.**

4b. Which of the graphs above represents a more inelastic response to a price increase for coffee for a caffeine junkie? **C**

4c. The price of fresh salmon fell from \$25/lb to \$20/lb, causing an increase in quantity demanded of 60 lbs to 80 lbs. What is the price elasticity of demand for fresh salmon in this market, and what happens to total revenue? Please calculate the precise elasticity and show your work.

$E = 1.29$, total revenue increases.

4d. The price of milk increased from \$5/gallon to \$6.50/gallon, causing a decrease in quantity demanded of 800 to 700. What is the price elasticity of demand for milk in this market, and what happens to total revenue? Please calculate the precise elasticity and show your work.

$E = 0.51$, total revenue increases.

5. Production costs

- a. Complete the following table.

<u>Q</u>	<u>FC</u>	<u>VC</u>	<u>TC</u>	<u>ATC</u>	<u>MC</u>
0	15	0	15	---	---
1	15	3	18	18	3
2	15	7	22	11	4
3	15	20	35	11.6	13

- b. What is the shape of the ATC curve? Explain why this is the case in general.

U-shaped: falling due to spreading of fixed costs, rising eventually due to increasing variable and marginal costs.

- c. What is the shape of the MC curve? Explain why this is the case in general.

Eventually increasing due to diminishing productivity: in the short run, all factors except labor are fixed so adding additional workers decreases marginal product (productivity), driving marginal costs up.

- d. Explain (briefly) the relationship between ATC and MC.

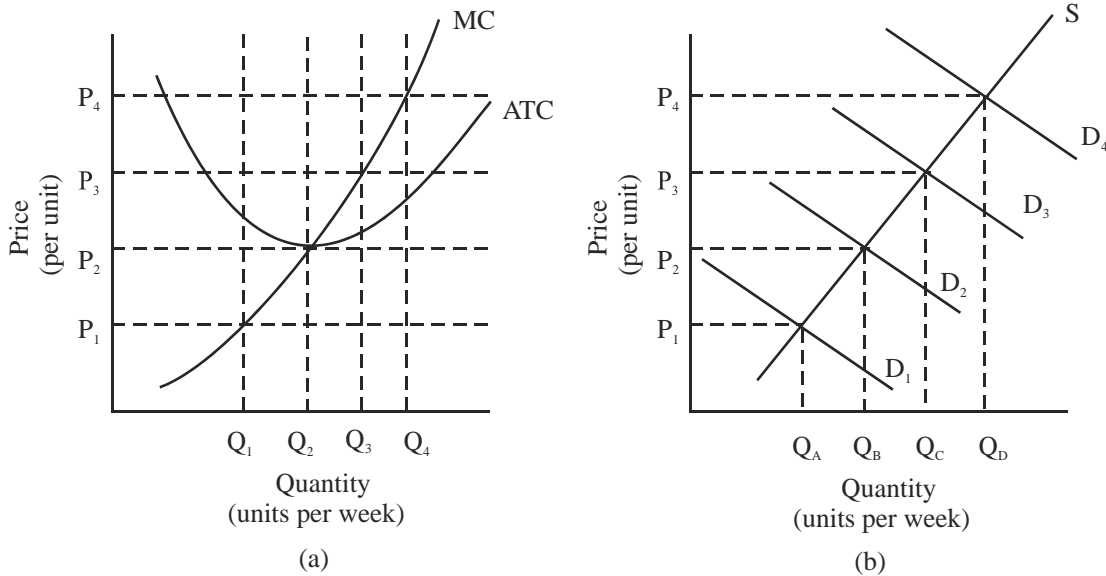
MC intersects ATC at its minimum.

If $MC > ATC$, ATC increases.

If $MC < ATC$, ATC decreases.

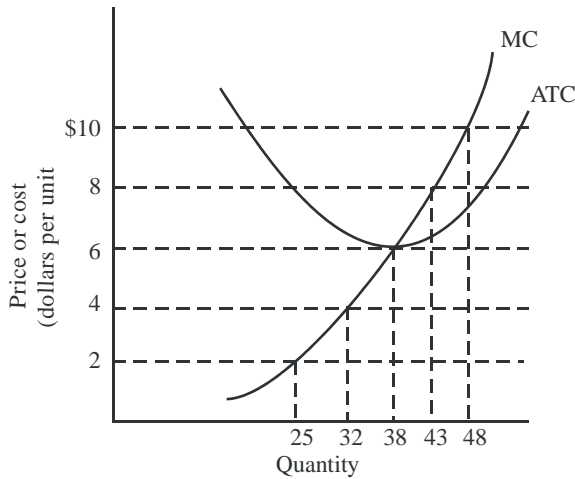
6. Perfect competition

In the figure below, graph (a) presents the cost curves that are relevant to a firm's production decision, and graph (b) shows the market-demand and market-supply curves for DVD players.



- 6a. If the market demand is D_2 , and the supply curve is S , the market price will be:
 A) P_1 . B) P_2 . C) P_3 . D) P_4 .
Ans: B
- 6b. Suppose an economic boom results in a shift in the demand curve for DVD players to D_4 . In the short run, the firm will produce:
 A) Zero output. B) Q_1 . C) Q_2 . D) Q_4 .
Ans: D
- 6c. Over time, at a price of P_2 :
 A) Firms will enter the market. C) Total revenue exceeds average total cost.
 B) Economic profits equal zero. D) Firms will exit the market.
Ans: B
- 6d. If the demand curve is D_1 , then over time:
 A) Economic losses occur, and firms will exit.
 B) Economic profits occur, and new firms will enter.
 C) Economic profits are zero, and no entry or exit will occur.
 D) Economic losses occur, and new firms will enter.
Ans: A

7. Perfect competition II. Use the figure below to answer questions 7a-7e.



7a. The above figure represents a perfectly competitive firm. If price is \$6, the profit-maximizing rate of output is:

- A) 32 units. B) 38 units. C) 43 units. D) 48 units.

Ans: B

7b. The above figure represents a perfectly competitive firm. If price is \$4, the profit-maximizing rate of output is:

- A) 43 units. B) 38 units. C) 32 units. D) 25 units.

Ans: C

7c. The above figure represents a perfectly competitive firm. If price is \$8, the firm is:

- A) Earning an economic profit. C) Maximizing efficiency.
 B) In long run equilibrium. D) All of the above.

Ans: A

7d. The above figure represents a perfectly competitive firm. If price is \$6, the firm is:

- A) Earning zero economic profit. C) Maximizing efficiency.
 B) In long run equilibrium. D) All of the above.

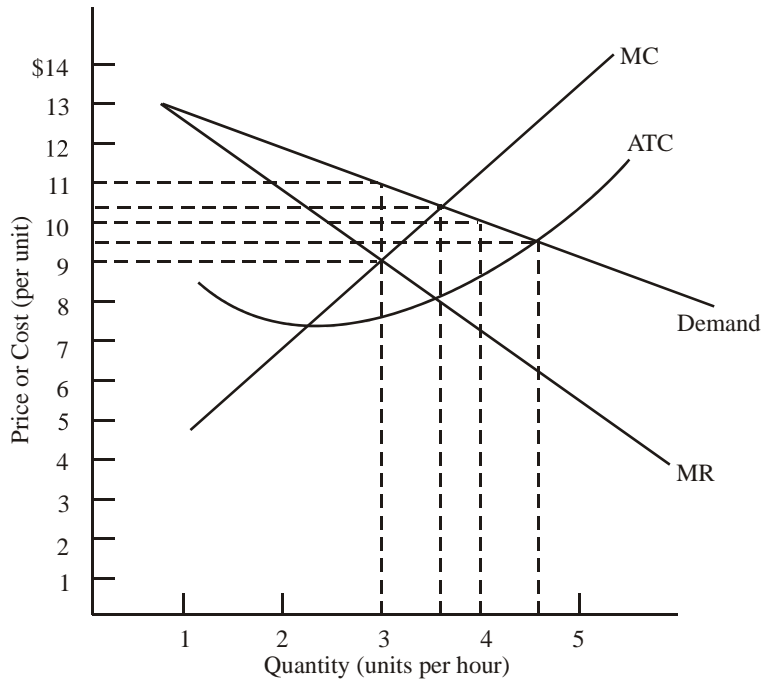
Ans: D

7e. The above figure represents a perfectly competitive firm. If price is \$4, the firm is:

- A) In long run equilibrium. C) Maximizing efficiency.
 B) Earning an economic loss. D) Earning an economic profit.

Ans: B

8. Monopoly



- 8a. The profit-maximizing level of output for a monopolist is:
A) 3 units. B) 4 units. C) Between 3 and 4 units. D) Between 4 and 5 units.
Ans: A
- 8b. The price charged by a profit-maximizing monopolist is:
A) \$9.00. B) \$10.00. C) \$10.50. D) \$11.00.
Ans: D
- 8c. At the profit maximizing level of output for a monopolist, marginal cost is:
A) \$9.00. B) \$10.00. C) \$10.50. D) \$11.00.
Ans: A
- 8d. Profit per unit for a profit-maximizing monopolist is closest to:
A) \$1.00. B) \$3.00. C) \$7.50. D) \$8.00.
Ans: B
- 8e. If this industry is competitive, the profit-maximizing level of output is:
A) 3 units. B) 4 units. C) Between 3 and 4 units. D) Between 4 and 5 units.
Ans: C
- 8f. If this industry is competitive, the profit-maximizing price is:
A) \$9. B) \$11. C) Between \$9 and \$10. D) Between \$10 and \$11.
Ans: D

9. Perfect competition versus Monopoly

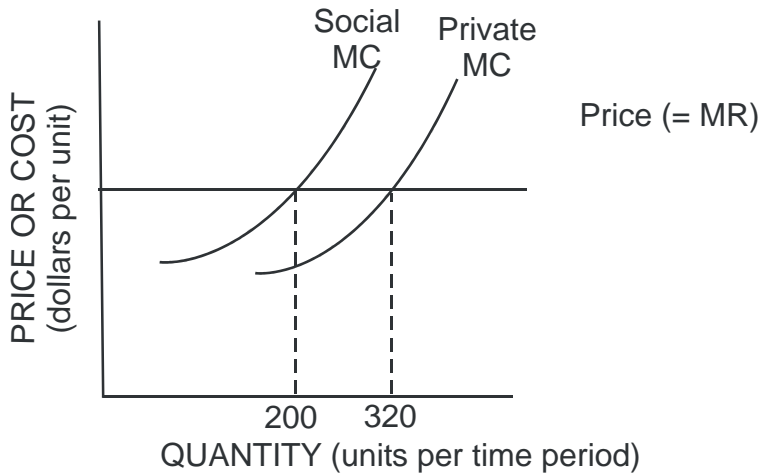
If the on-campus demand for soda is as follows:

Price (per can)	\$0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00
Quantity demanded (per day)	100	90	80	70	60	50	40	30
TR	25	45	60	70	75	75	70	60
MR		-2	-1.50	-1	-0.5	0	0.5	1

and the marginal cost of supplying a soda is 50 cents, what price will students end up paying in.

- A perfectly competitive market? $p=mc=\$0.50$
- A monopolized market? $mr=mc=\$1.75$

10. Externalities as market failure



10a. If pollution costs are external, the rate of output will be:

- A) Less than 200 units. B) 200 units. C) 320 units. D) Greater than 320 units.

Ans: C

10b. If the firm chooses a production method that results in zero external costs, the rate of output will be:

- A) Less than 200 units. B) 200 units. C) 320 units. D) Greater than 320 units.

Ans: B

10c. If the rate of output is 320 units:

- A) Social costs exceed private costs.
B) There is market failure.
C) More output is produced than is socially optimal.
D) All of the above.

Ans: D

10d. Briefly describe what it means to “internalize an externality.”

The unification of market and social demand or cost curves, often accomplished through taxes (on negative externalities) or subsidies (on positive externalities).