(1 pt.) Name: _____KEY_____

Questions 1-3: multiple choice, 4 points each, circle correct answer.

C

1. The short-run market supply curve for a perfectly competitive industry
   a) Is upward-sloping for an increasing cost industry but is flat for a constant cost industry, and downward-sloping for a decreasing cost industry.
   b) Is the sum of the average variable cost curves above their minimum points for all firms in the industry.
   c) Is upward-sloping because of the law of diminishing returns.
   d) Is U-shaped because at first AFC is declining sharply but for higher outputs AVC is increasing.

A

2. A profit-maximizing monopolist should shut down in the short run if
   a) Its revenues fall short of its variable costs.
   b) Its revenues fall short of its fixed costs.
   c) Its economic profits are negative.
   d) Shutting down is a long-run decision, so the question does not have a logical answer.

3. In raising alligators, you find that in the short run your revenues and costs vary with output in the following manner:

Quantity	48	49	50	51	52	53	54	55	56
Total Revenue	$9600	$9800	$10000	$10200	$10400	$10600	$10800	$11000	$11200
Marginal Cost	$150	$160	$170	$185	$200	$220	$245	$275	$310

MR = 200

C

What output should you produce if your goal is to maximize short-run profits?
a) 48   c) 52
b) 50   d) 54

4. (10 pts.) Why were the rates charged by owners of supertankers to transport oil so high in early 1973 yet so low two years later? Use a diagram to explain your answer.
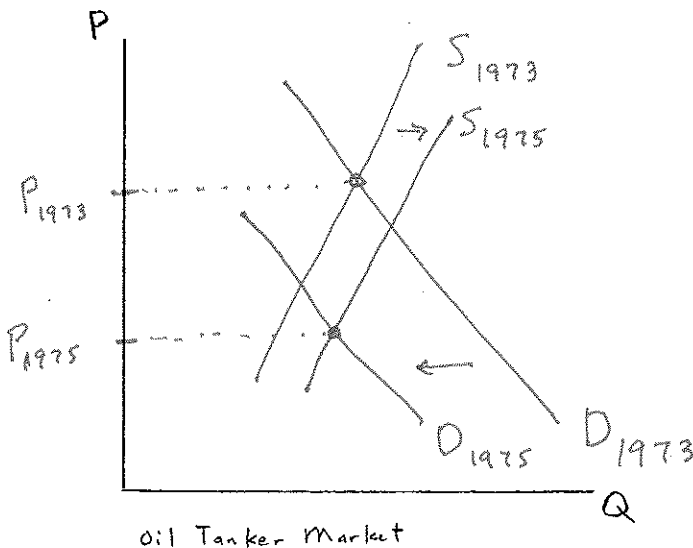
Oil Tanker Market

Because of war in the Mideast, demand for tanker services declined from 1973 to 1975. There were many new tankers under construction in 1973 that came into service by 1975, so supply increased.

5. (20 pts.) Suppose that the mayor's sister is granted a monopoly charter by the Lexington city council to operate a Frisbee golf course. She can produce any level of output that she wishes at a constant marginal cost of $5 per unit. Since she owns the only Frisbee golf course in town, anyone who wants to play must patronize her course. Assume that all Frisbee golfers are alike, and each one has an annual demand for playing that is given by Q=70-2P, where Q refers to the number of rounds played per year and P refers to price.

a) What are the monopoly's profit-maximizing price and output? How much profit would she make off of each golfer in a year? A graphical answer is sufficient. Illustrate in the attached diagram.

b) As a member of city council, you voice an objection. If the city were to operate the program itself, it would charge $5 per round. The mayor responds that the monopoly profits his sister is earning come out of the pockets of well-to-do Frisbee golfers, and besides, she contributes to charities that support orphans and widows. You respond, "But what about the deadweight loss?" He doesn't understand, and asks you to explain and to illustrate in the diagram the deadweight loss due to his sister behaving as a profit-maximizing monopolist. Calculate the dollar amount of the deadweight loss.

$\frac{1}{2} \cdot 15 \cdot 30 = 225$
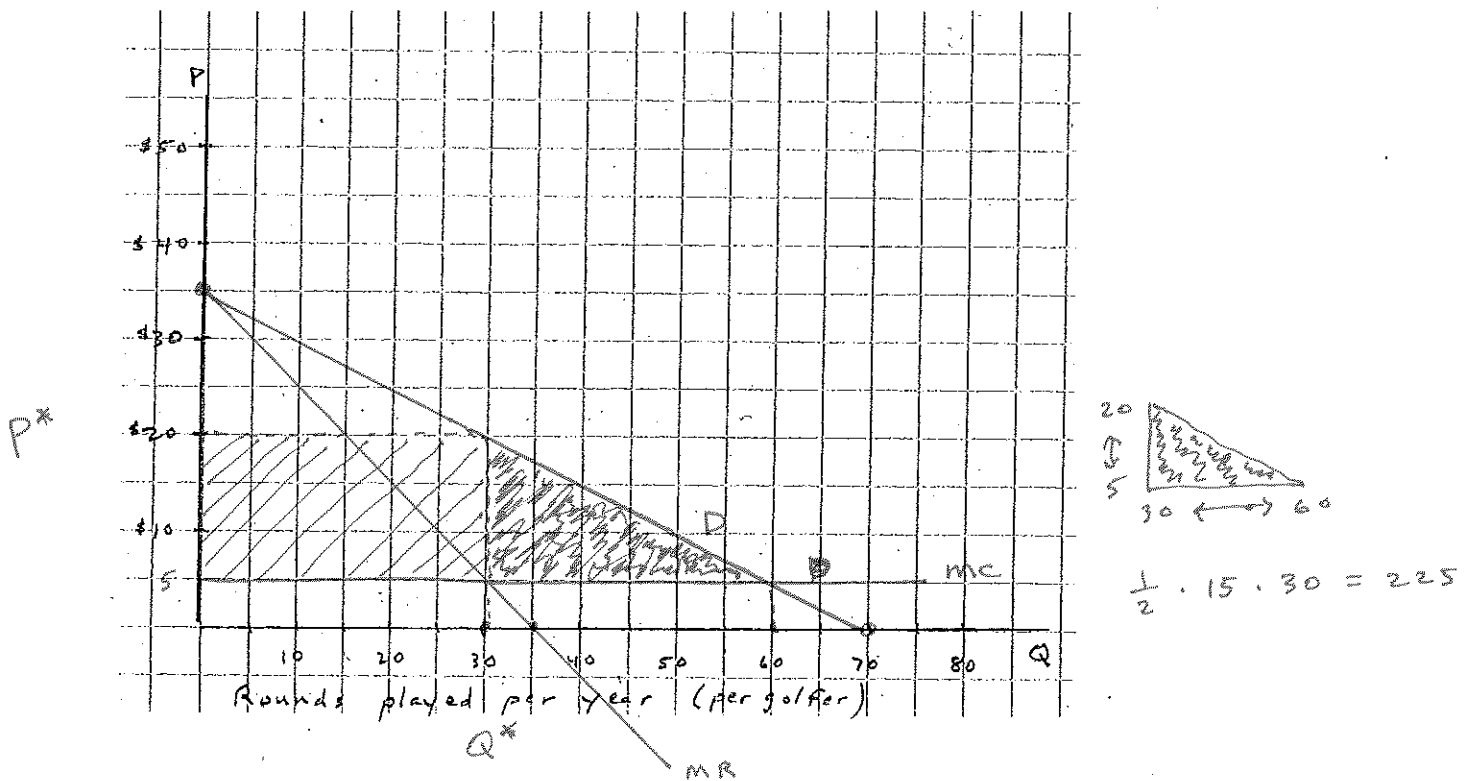
(a) $P^* = \$20$, $Q^* = 30$, $\pi = \boxed{} = \$450$

(b) If the price per round were $5, each golfer would play 60 rounds per year, instead of the 30 rounds they play when the mayor's sister gouges them by charging $20 per round. The consumer's surplus that golfers would get if price equaled marginal cost that they do not get when price is set at the monopoly level is a deadweight loss — a loss to one person that is not offset by a gain to somebody else. $\boxed{} = \$225$

6. (10 pts.) There are two bowling alleys in your hometown. Each is currently producing a rate of output equal to Q_0. The long-run average cost curve for a typical bowling alley is illustrated below. The market demand curve for bowling in your hometown is labeled D in the diagram. Explain what you think is likely to happen over time in this market, using the diagram to explain why.
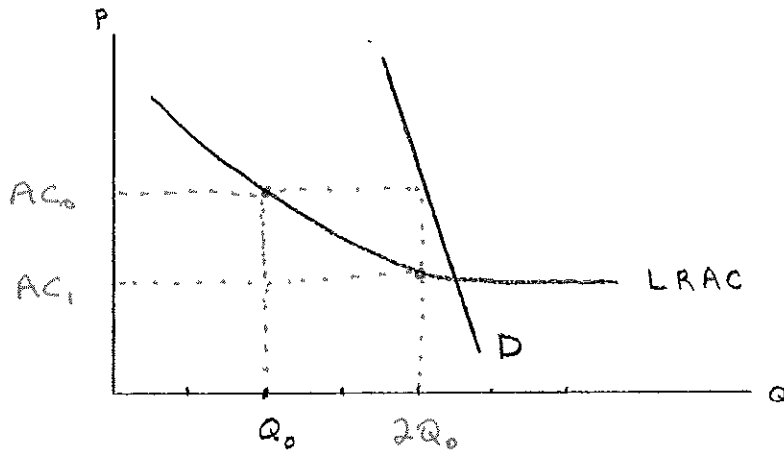
natural monopoly —
One large firm has
lower per unit costs
than two smaller
firms that divide the
market. So whichever firm gets bigger faster can
set price below its rival's costs and drive them
out of the market. End result will be a market
served by one large firm.

7. (12 pts.) Knowing what you do about the characteristics of different types of markets, briefly explain what type of market structure each of the following markets is:

a) Fast-food restaurants in Lexington

Monopolistic competition
• many firms
• differentiated product
• low entry barriers

b) Automobiles

differentiated oligopoly
• a few firms
• differentiated product

c) Strawberry farming

perfect competition
• many firms
• homogeneous product
• low entry barriers

d) UK basketball

monopoly — only producer of a product
for which there are no close substitutes

8. (15 pts.) A monopolist faces an inverse demand curve given by P=12-Q. Its total cost function is given by TC(Q)=10 + 0.5Q².

a) In the diagram below, graph the firm's total revenue, total cost, and profit functions. What output and price combination will maximize profits? What are profits?

$TR = P \cdot Q = 12Q - Q^2$ $\qquad$ $TC = 10 + 0.5Q^2$

$MR = \dfrac{dTR}{dQ} = 12 - 2Q$ $\qquad$ $MC = \dfrac{dTC}{dQ} = Q$
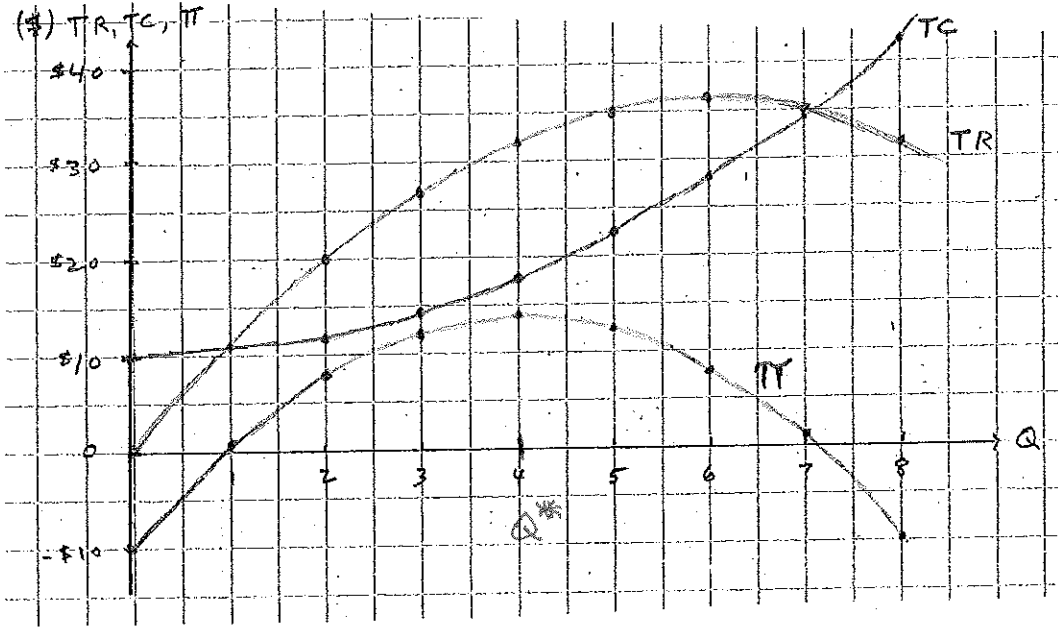
P	Q	TR	TC	π
12	0	0	10	-10
11	1	11	10.5	0.5
10	2	20	12	8
9	3	27	14.5	12.5
8	4	32	18	14
7	5	35	22.5	12.5
6	6	36	28	8
5	7	35	34.5	.5
4	8	32	42	-10

b) Derive the firm's marginal revenue and marginal cost functions, and solve for the profit-maximizing output and price. Verify that your answer matches what you did above.

$MR = \dfrac{dTR}{dQ} = 12 - 2Q$

$MC = \dfrac{dTC}{dQ} = Q$

π max is where MR = MC:

$12 - 2Q = Q$

$3Q = 12$

$Q^* = 4$

$P^* = 12 - Q = 8$ ✓

9. (20 pts.) The year is 2007. The market for catfish is in long-run equilibrium, with the price of catfish equal to $0.75. A typical catfish farmer produces 500,000 pounds of catfish per year, and the total U.S. production of catfish is 100,000,000 pounds per year.

a) In the diagrams below, illustrate the initial situation and label it (a). Your diagrams should include market-level D and S curves and firm-level d, mc, and atc curves consistent with the above facts.
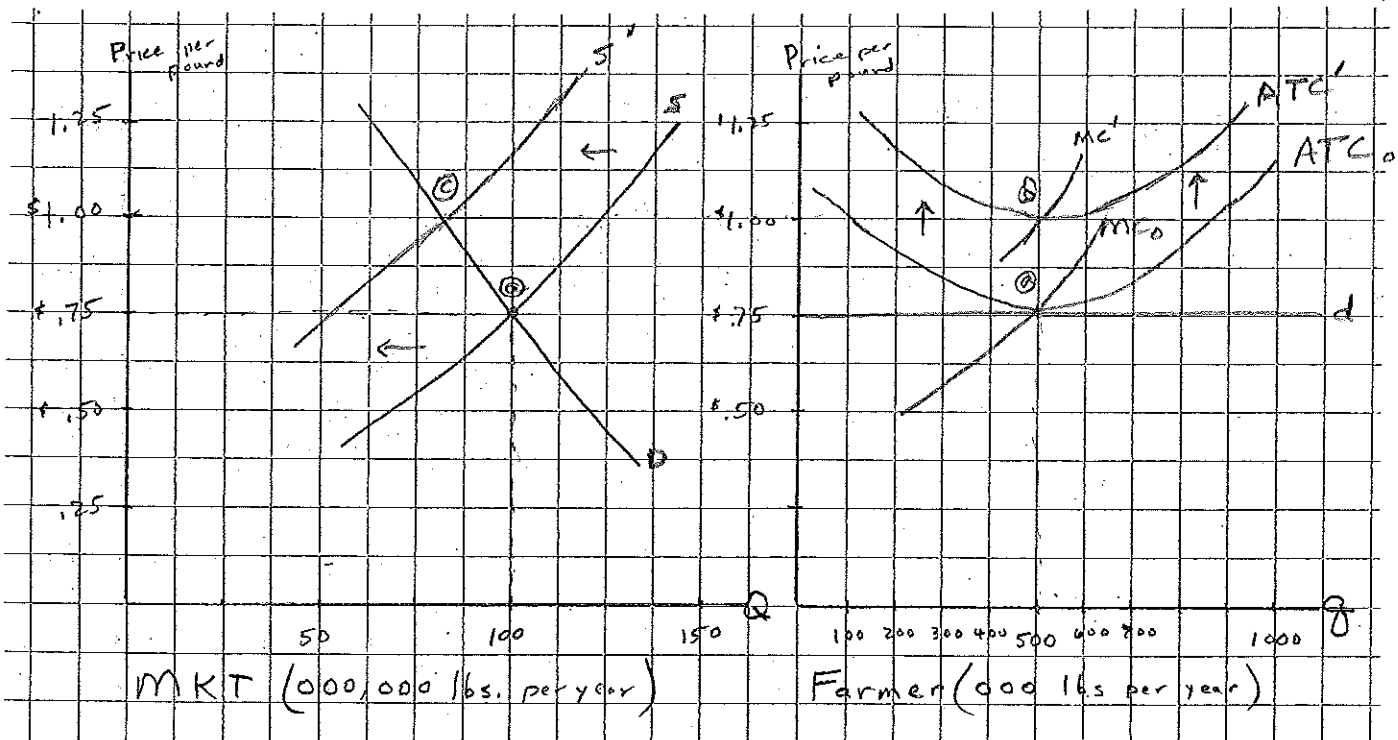
b) Congress passes legislation that subsidizes the production of ethanol made from corn, causing corn prices to increase sharply. Since corn is a primary input in raising catfish, the cost of producing catfish rises by one third. Explain briefly below and illustrate the short-run effect on the costs and profits of catfish farmers in your diagram.

The increase in the cost of raising catfish (due to higher corn prices) causes ATC curve to shift upward (by 33%). Catfish farmers will suffer short-run economic losses.

c) Suppose that the increase in corn prices is permanent. Explain below and illustrate above what you think will occur in the catfish farming industry over time. Your answer should address what will happen to market price and output, and to the output and economic profitability of a typical farmer after the industry has reached a new long-run equilibrium.

Losses will cause some catfish farmers to exit the market, and market supply will shift to the left. Eventually we expect price to rise high enough so that surviving farmers are able to earn a normal return (zero economic profit). Higher market price, and lower output.