

Name: _____

Agricultural Economics 101

Exam #2

November 19, 1990

SHOW ALL WORK

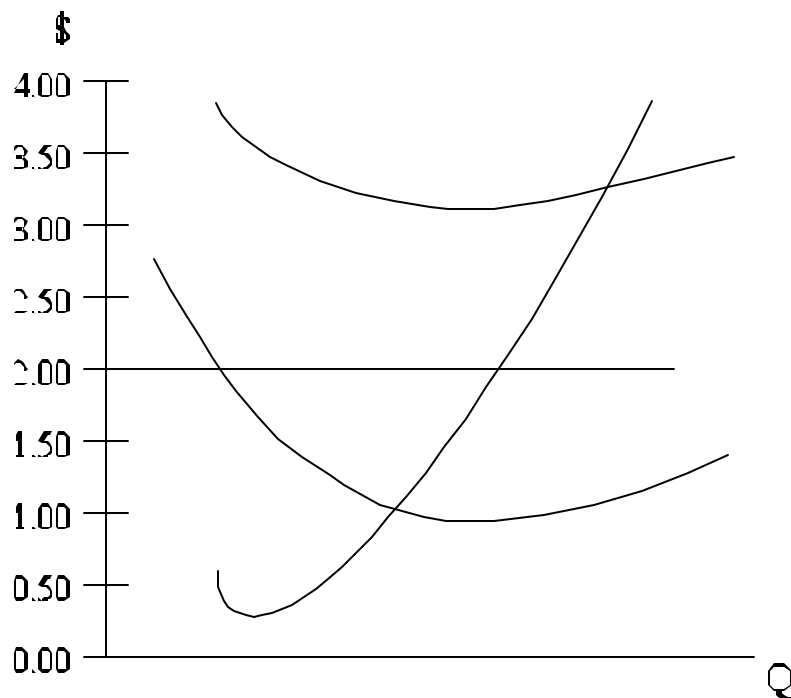
I. _____ (30 pts.)

II. _____ (24 pts.)

III. _____ (20 pts.)

IV. _____ (20 pts.)

V. _____ (6 pts.)



I. The marginal revenue (MR), marginal cost (MC), average variable cost (AVC), and average total cost (ATC) curves for a firm producing output (Q) are shown above. Given this information, please determine or indicate the following:

- (a) On the graph above indicate the level of output (Q^*) at which the producer is maximizing profits.
- (b) Determine the total revenue at (your) Q^* .
- (c) Determine the marginal revenue at Q^* .
- (d) Determine the total cost of production at Q^* .
- (e) On the graph above indicate the firm's short-run supply curve.

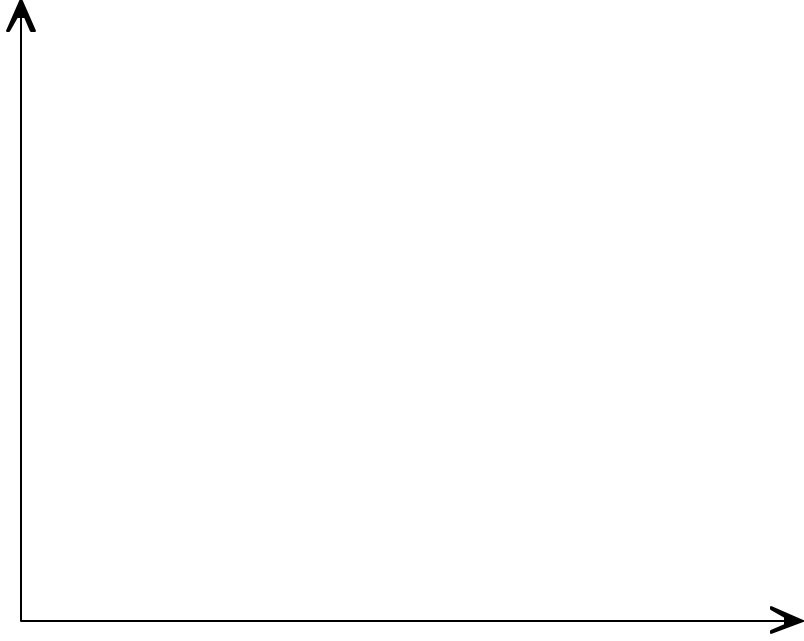
- II. A farm operator has asked you to help him/her determine the quantity of water that should be applied to a crop under irrigation. The crop is being irrigated via a sprinkler system that can be regulated in terms of the number of times per day that water is applied. The total physical product (TPP) for the crop is shown below for different application rates per day. Note that the same amount of water is delivered at each application and that the crop currently sells for \$2.10/bu.

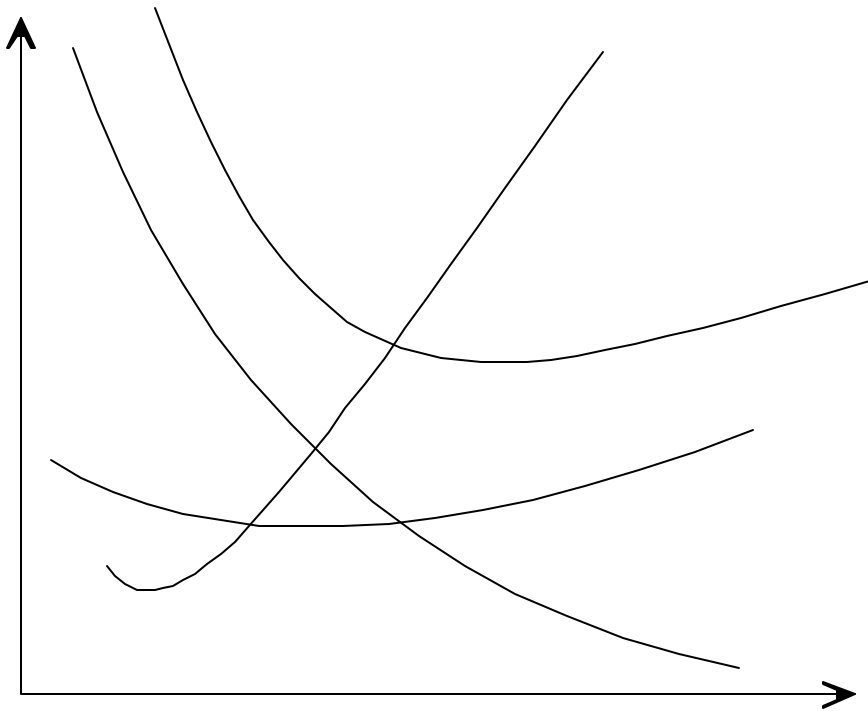
<u>Number of Applications Per Day</u>	<u>Total Physical Product (bu/acre)</u>
0	142
1	152
2	160
3	165
4	166

Given this information, please answer the following:

- (a) On the attached graph, graph the farmer's demand curve for water. Be certain to label both axes.
- (b) If each application of water costs \$19/acre, determine the number of applications of water per day that will yield maximum profits.
- (c) If the price of water increases to \$22 per application, determine the number of applications that should now be made per day.
- (d) What impact does a change in the price of water have on the demand for water? (increase, decrease, no impact)

Graph for II(a):





III. In his quest for lifelong financial success, Ed Burger has decided not to grow tomatoes for the State College market next year but to purchase tomatoes from other producers and produce his own brand of spaghetti sauce for sale. He plans to market his sauce throughout Pennsylvania but recognizes the difficulty of accomplishing this, given the large number of other sauce producers in this market. He recognizes that the market for spaghetti sauce is a perfectly competitive market, with many ambitious producers including himself.

Ed has determined the marginal cost (MC), average total cost (ATC), average variable cost (AVC), and average fixed cost (AFC) curves for spaghetti sauce in 1989 (shown above). If the price of tomatoes sold for sauce is lower in 1990 than in 1989, indicate on the graph above the impacts of his change on the curves shown. Be certain to label all curves and both axes.

IV. True or false? Correct those statements that are false so that they become true.

_____ (a) $MC = \frac{\text{Change in costs}}{\text{Change in input}}$

_____ (b) $AFC = ATC - AVC$

_____ (c) Under the following conditions, normal economic profits are being earned and pure economic profits equal 0:

$$MC = MR > ATC$$

_____ (d) The long run average total cost curve (LRATC) slopes downward to the right when economies of size exist.

_____ (e) Profits are maximized when $MC = MR$ and $TR < TC$.

_____ (f) When the value of the marginal product is more than the price of the input, more of the input should be used.

_____ (g) When $MC < MR$ the level of output produced should be decreased until $MC = MR$.

_____ (h) The total fixed cost (TFC) curve is a horizontal line.

_____ (i) When the average total cost of production equals the price of the output (i.e., $ATC = P$) producers can be expected to quit production or reduce their level of production.

_____ (j) When the percentage change in the price of a commodity is greater than the associated percentage change in the quantity of the commodity supplied, supply is said to be inelastic. (*Note: this material is now covered on exam #1.*)

- V. Ed and his best friend, Joe, have cornered the salsa market in State College, and are the only two suppliers. Shown below are projections of their costs associated with different levels of output for the 1991-92 season.

Ed B.			
Output (caseload)	AVC (\$)	AFC (\$)	MC (\$)
1	200	10.00	40
2	120	5.00	60
3	100	3.33	140
4	110	2.50	160
5	120	2.00	

Joe			
Output (caseload)	AVC (\$)	AFC (\$)	MC (\$)
1	100	10.00	40
2	70	5.00	60
3	67	3.33	140
4	85	2.50	160
5	100	2.00	

If the price of salsa is \$50 per caseload, how many caseloads will be supplied in total to State College in the short-run. Explain your answer.