100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers.

1. (10 pts.) From an article in *Oklahoma Farm Report* (11/11/19) entitled "Size of 2019 Oklahoma Pecan Harvest Could Be Determined by Prices":

So what does the pecan crop look like this year? Rohla says "for Oklahoma, with 75% of our production being natives, its going to really depend on the price. A grower is really going to need a dollar, to a dollar fifteen per pound to really go out and start harvesting and bringing those to the market." Right now, the prices are hovering around that dollar mark, which Rohla says is going to deter some producers to go out there and pick it up. "If the market should get up to around a dollar twenty-five, he says there could easily be thirty-two, to thirty-five million pounds out in Oklahoma"

What do you infer about SRAVC and SRATC curves for Oklahoma pecan growers based on the above quote from a pecan expert? (A typical pecan grower produces several hundred thousand pounds of pecans per year.) Explain and illustrate your answer in the diagram below.

P

$2.00 ┼

$1.00 ┼

        |_____→ Q
   100,000 200,000 300,000 400,000 500,000
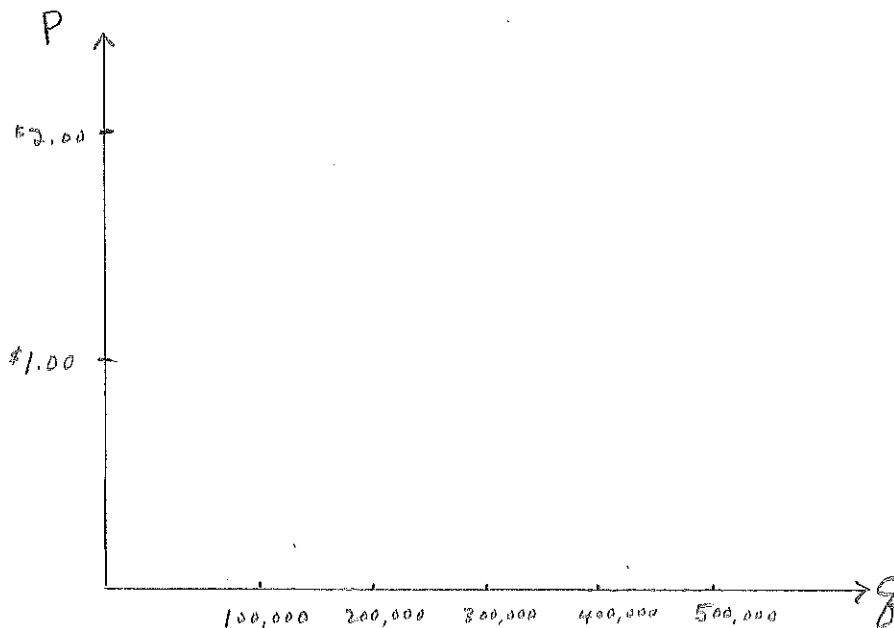
typical pecan grower

2. (20 pts.) Concerns over the coronavirus pandemic have reduced the demand for restaurant meals. Currently many (most?) restaurants are suffering short-run economic losses. Illustrated below are the ATC and MC curves for a typical sit-down restaurant. Draw D and MR curves and show the optimal price and output as well as the associated (negative) profits for a restaurant that is experiencing such short-run economic losses. Then explain and illustrate what you expect to happen over time if the short-run reduction in demand for restaurant meals turns out to be a permanent change in how and where people choose to consume food.
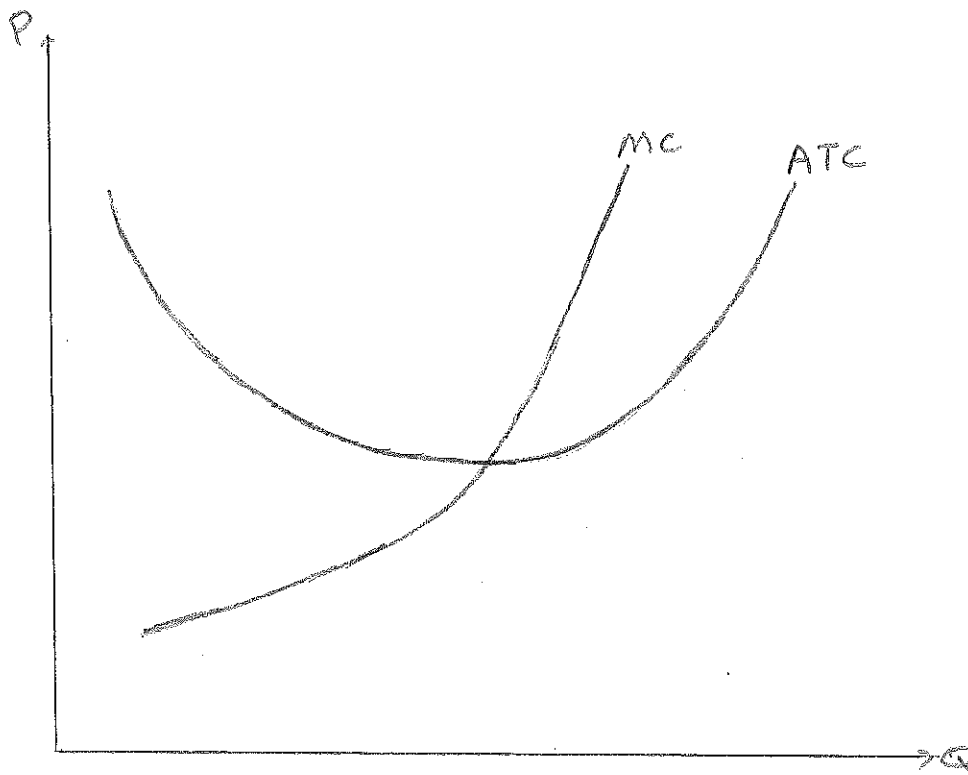
3. (20 pts.) The year is 1990. Most pork is produced on family farms in the Midwest—farms whose primary output is corn and who raise hogs as a side product. The long-run average cost curve ($LRAC_0$) and associated long-run marginal cost curve ($LRMC_0$) for a firm using this technology are illustrated in the diagram below. The market for pork is in long-run equilibrium, with total market quantity exchanged equal to Q_0. Draw market demand and supply curves consistent with the situation in 1990, and illustrate the firm's optimal output and its profits in long-run equilibrium. Briefly explain your graphical answers.
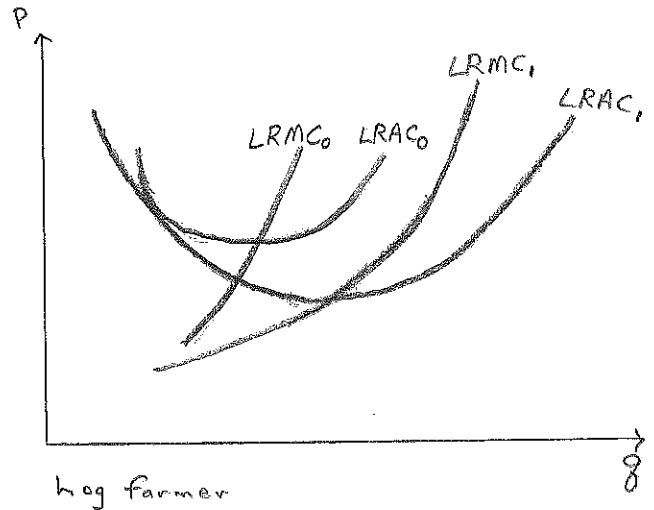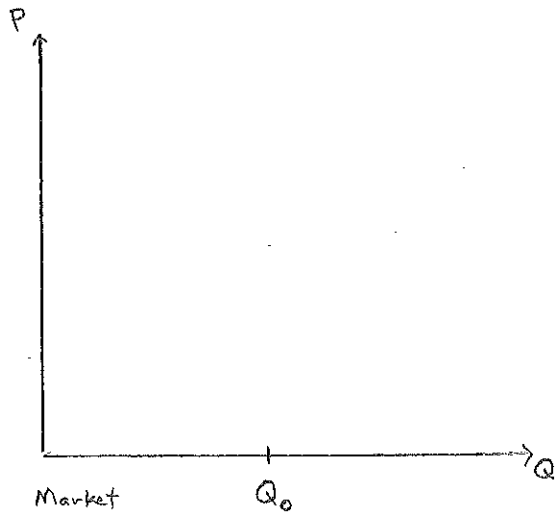

Now a change in technology occurs. Factory farming methods ("Power Pork," *WSJ* 1994) are applied to pork production, increasing the MES and significantly reducing the cost of producing pork. This change is illustrated by the new $LRAC_1$ and $LRMC_1$ curves. What do you predict will happen in the market for pork? Illustrate the profit position of initial adopters of the new technology. As more and more firms adopt the new technology, what happens to the profit position of Midwestern family farms still raising hogs the old way? What does long-run equilibrium look like after all market adjustments have occurred, in terms of the number of hog farms, market price and output, and economic profits of those firms who are left in the market?

4. (10 pts.) You take over as CEO of a manufacturer of industrial parts. Your company's current pricing strategy is to mark up each item in your product line by 30% above marginal cost. You are puzzled why previous managers did this, since some of your products are very unique and other products are commodities. You instruct your marketing research department to study own-price elasticity of demand for two of your products, X and Y. They both have marginal costs of $1.00, and are currently both priced at $1.30. You find that own-price elasticity of demand for good X is 10, and own-price elasticity of demand for good Y is 1.2. How would you set prices for these two products? Explain your logic and show your work, including any formula that you use.

5. (5 pts.) Why do price wars sometimes break out among cruise ship operators?

6. (15 pts.) The Nashville City Council engages your consulting company to conduct marketing research and help them determine the profit-maximizing price to charge for their version of the Parthenon. They have already determined that their cost structure is quite simple, $MC = AC = \$1.00$ per visitor. After some market experiments, you determine that quantity demanded, measured as weekly visitors, depends on the price of admission as follows: $Q = 800 - 100*P$, where Q is weekly visitors and P is the price of admission. What price do you recommend that they charge, how many tickets per week will they sell, and what will their profits be? Illustrate your answer in the diagram below and briefly explain.

P

8
7
6
5
4
3
2
1

100 200 300 400 500 600 700 800 900 Q

Weekly visitors
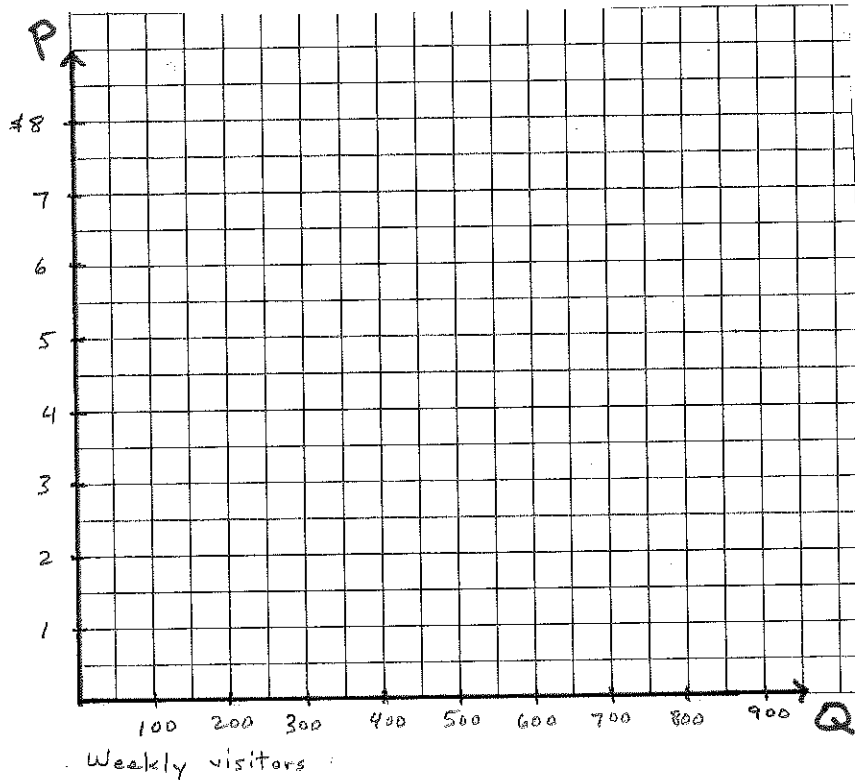
7. (5 pts.) When conducting your market experiments, you noticed that when price was $6.00 or above, almost all the visitors were childless adults. But when price fell to the $2-$3 range, most of the additional customers were families with children. Can you think of any more creative pricing strategies that would increase the profits Nashville might make from their Parthenon?

8. (15 pts.) Hansel and Gretel play a static game of complete information. Hansel has three strategy options, Top, Middle, and Bottom. Gretel has four strategy options, Far Left, Left, Right, and Far Right. The strategy options and the associated payoffs are represented in the payoff matrix below:

		Gretel			
		Far Left	Left	Right	Far Right
Hansel	Top	3, 9	6, 6	15, 12	18, 15
	Middle	0, 6	12, 15	0, 9	15, 12
	Bottom	6, 30	9, 36	12, 18	21, 27

What do you predict will be the outcome of this game? Describe step-by-step the solution strategy you use to solve for the outcome.