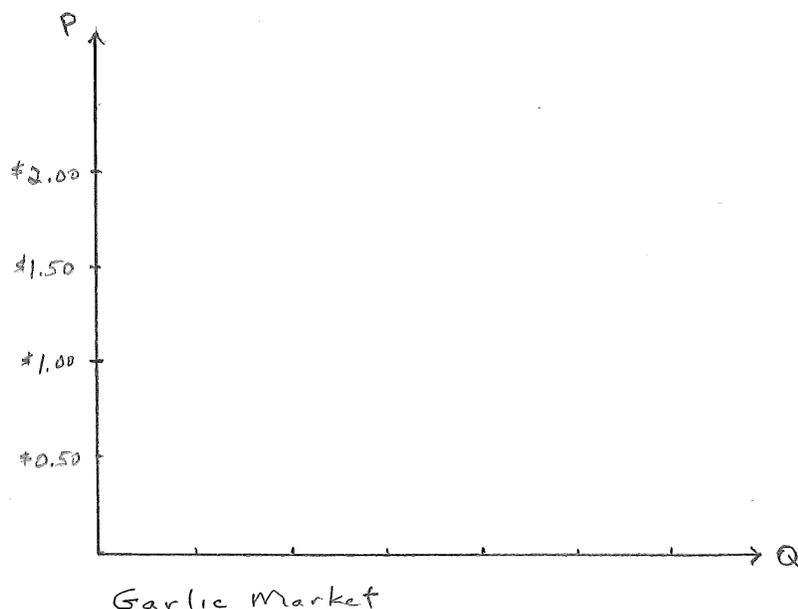


100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers.

1. (15 pts.) Two things have been occurring in the U.S. market for garlic lately (*WSJ* 2/21/20). First, garlic flavoring, commonly used in ethnic cuisines, has been growing in popularity. Second, the coronavirus outbreak has disrupted supply chains worldwide, especially in China where most of the garlic sold in the U.S. comes from. A sleeve of garlic, typically five bulbs, cost an average of \$1.42 in early February, up from \$1.00 in July 2019. Using demand and supply analysis, illustrate and briefly explain what has been going on in the garlic market.



2. (20 pts.) Kroger's observes that when it reduces the price of Bud Light beer (30 pack of 12 oz. cans) from \$24.99 to \$22.99, daily sales in a typical store increase by 25%. Calculate own-price elasticity of demand for Bud Light and explain how to interpret the number you get for your answer.

Kroger's also observes that when they put Bud Light on sale as described above, a typical Kroger's store experiences a decline in daily sales of Miller Lite beer 30-packs from 50 to 40. Calculate cross-price elasticity of demand between Bud Light and Miller Lite, and interpret your answer.

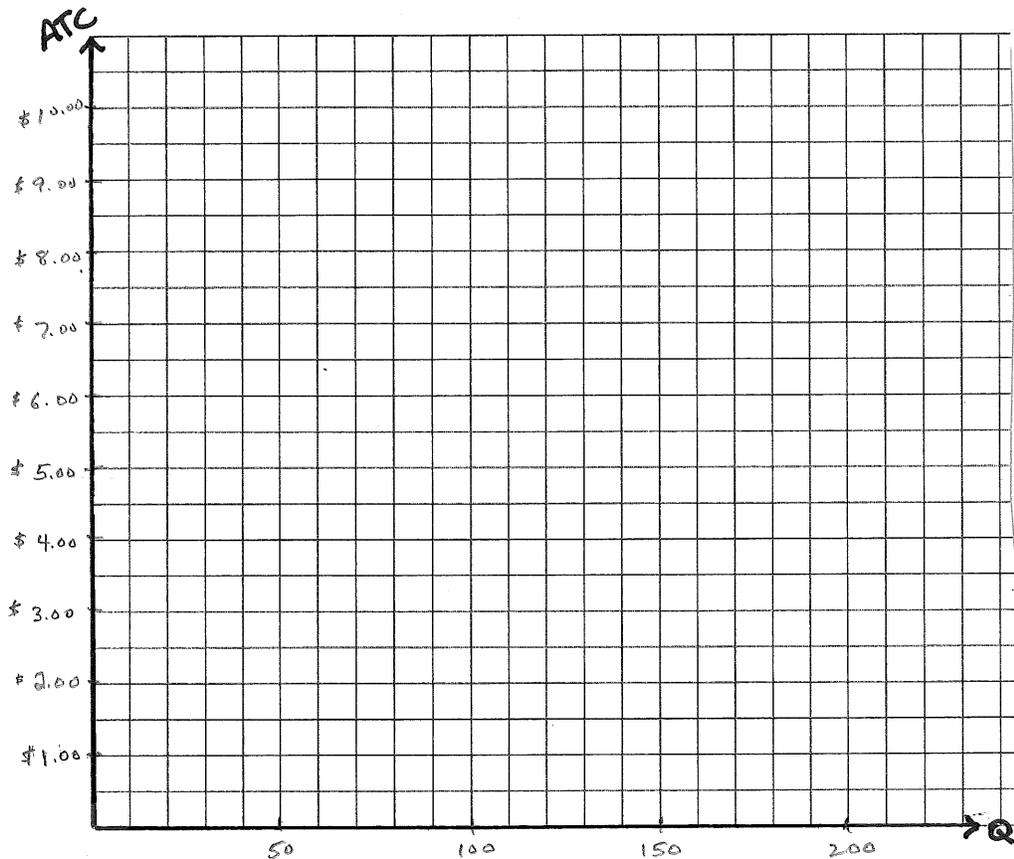
3. (15 pts.) Your friend Esmeralda works as a line cook at a local restaurant, earning \$45,000 per year. Feeling entrepreneurial, she is inspired to start her own business. She decides to open a food truck and serve food to the campus lunch crowd. After operating this business for a year, she shares the following information with you and asks for your assessment of its profitability. She opens her publicly audited books to you and you see \$200,000 in revenues each year from food sales. You also see \$30,000 in labor costs for hourly workers who help her run the business, \$80,000 in wholesale food costs, \$10,000 for gas and maintenance on the truck, \$20,000 for insurance, taxes, and business license fees, and \$5,000 for advertising and web site expenses. What are Esmeralda's accounting profits?

Esmeralda invites you to work alongside her for a while to help you assess other factors relevant to her business. You learn the following things. She works full time in her food truck but takes her compensation in the form of profits instead of paying herself a salary. Esmeralda owns her truck outright. Fully outfitted food trucks like hers cost \$75,000 when new, and have an expected life of five years, at which point they are worth nothing. Prior to buying her food truck Esmeralda had the \$75,000 parked in an indexed mutual fund where she earned 5%. What do you think of this business opportunity? Answer by calculating Esmeralda's economic profits (or losses), carefully explaining your logic.

4. (20 pts.) The following table describes the short-run production relationship for a firm that produces a single output, Q , with two inputs, L and K :

K	20	20	20	20	20	20
L	0	4	8	12	16	20
Q	0	15	48	81	96	100

Suppose that the wage rate is \$20 and the rental rate on each unit of capital is \$5. Using information from the table above, sketch the firm's average fixed cost, average variable cost, and average total cost curves in the diagram below, showing specific points on each curve based on your calculations.



Explain the economic logic behind the shape of the short-run average total cost curve you just drew above.

5. (15 pts.) Firms can produce either good X or good Y separately, or jointly produce both X and Y together. The production technology displays the following costs, where $C(i, j)$ represents the long-run total cost of producing i units of X and j units of Y:

$$C(5,0) = 125$$

$$C(10,0) = 275$$

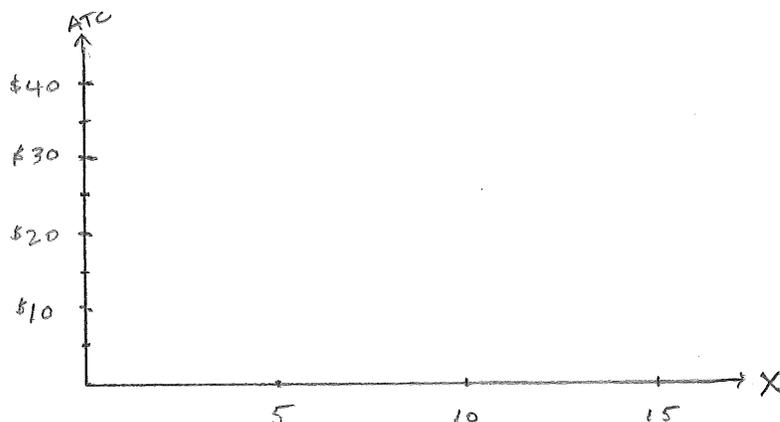
$$C(5,50) = 330$$

$$C(0,50) = 225$$

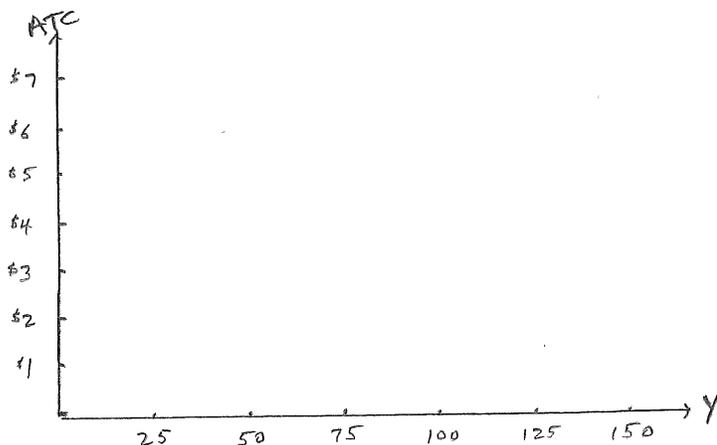
$$C(0,100) = 400$$

$$C(10,100) = 670$$

- a. Does this production technology display economies of scale in the production of good X? Graph two points on the LRAC for a firm that specializes in good X.



- b. Does it display economies of scale in the production of good Y? Graph two points on the LRAC for a firm that specializes in good Y.



- c. Does it display economies of scope? Do you expect to see firms specializing in either good X or good Y or firms producing both goods simultaneously? And what size firms, small or large?

