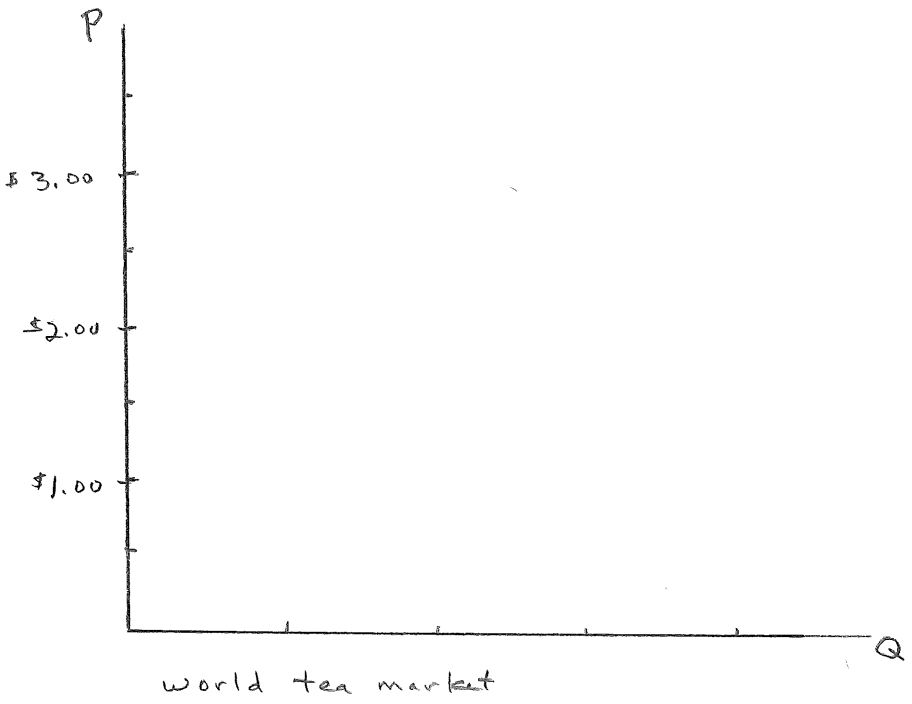
ECO 610 Name: _____
Midterm Exam-Sections 202/204
October 2020

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.) "Remote working arrangements and other home routines established during the coronavirus pandemic have led more people to reach for cups of tea, which is consumed in larger amounts world-wide than any drink other than water. But supplies of tea leaves are tightening, due to bad weather in some producer countries, labor shortages, port closures and other logistical issues." (*WSJ* 9/24/20). Prices in February were $2.10 per kilogram, but had risen to $3.20 by September. Using demand and supply analysis, illustrate and briefly explain what has been going on in the world tea market.



2. (20 pts.) You work for the division of motor vehicles in the vehicle licensing department. Standard license plates are $25 per year, but your department offers specialty license plates at a higher price. In particular, affinity plates for state universities are priced at $70 per year. The DMV decides to experiment with changing the price, to see if it can increase revenues. When it raises price to $80, the number of license plates sold for the flagship state university (think Big Blue) fall from 53,000 to 52,000. Calculate own-price elasticity of demand for Big Blue plates and explain whether you think this was a good move.

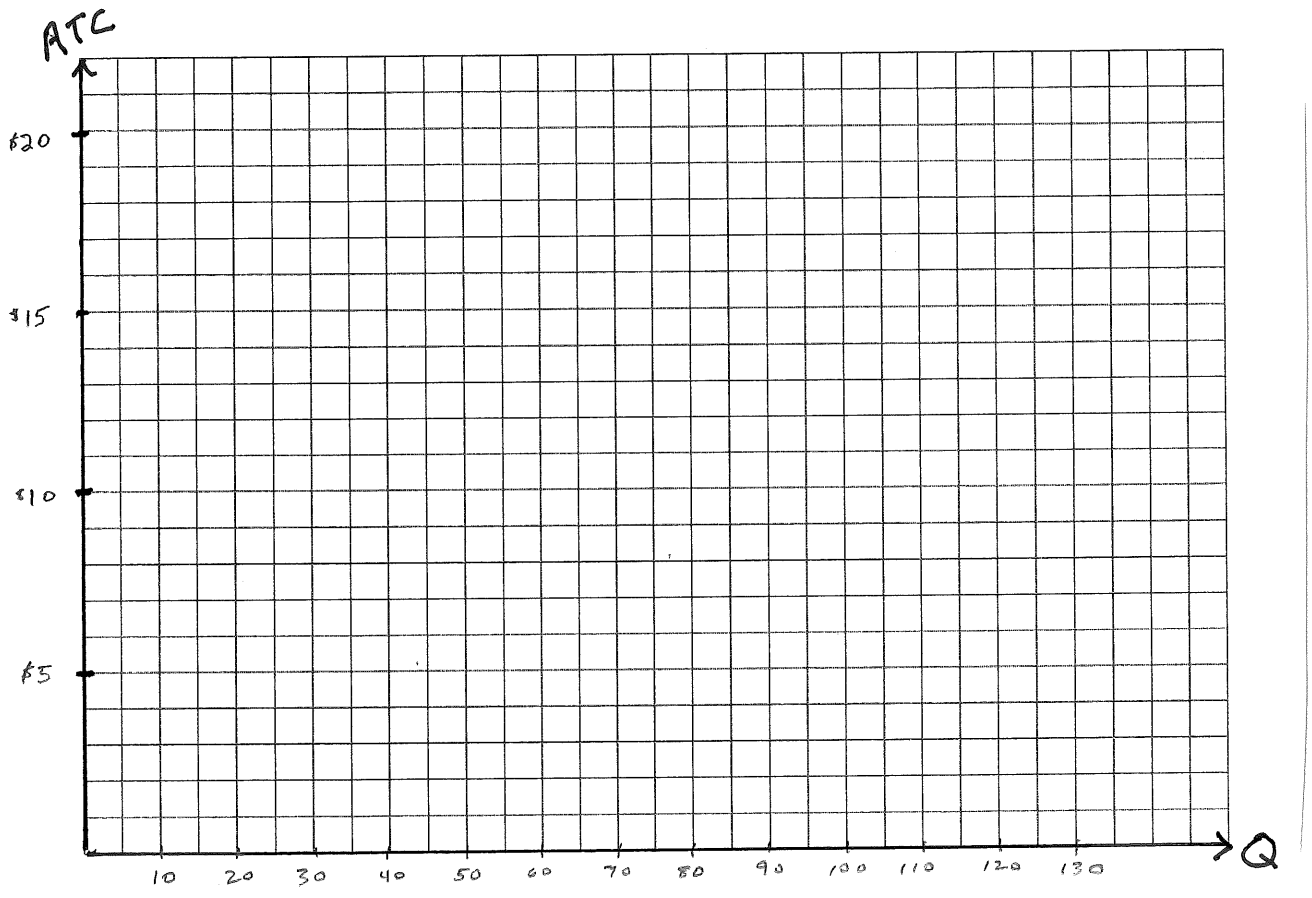
You observe that sales of affinity license plates for other universities fall off as well. For example, annual sales of the Red Bird version of the license plate decline by 25%. Calculate elasticity of demand for this version of the plate and explain how you might use this information to advise the DMV about their policy of pricing all university affinity license plates the same.

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 $220,000 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?

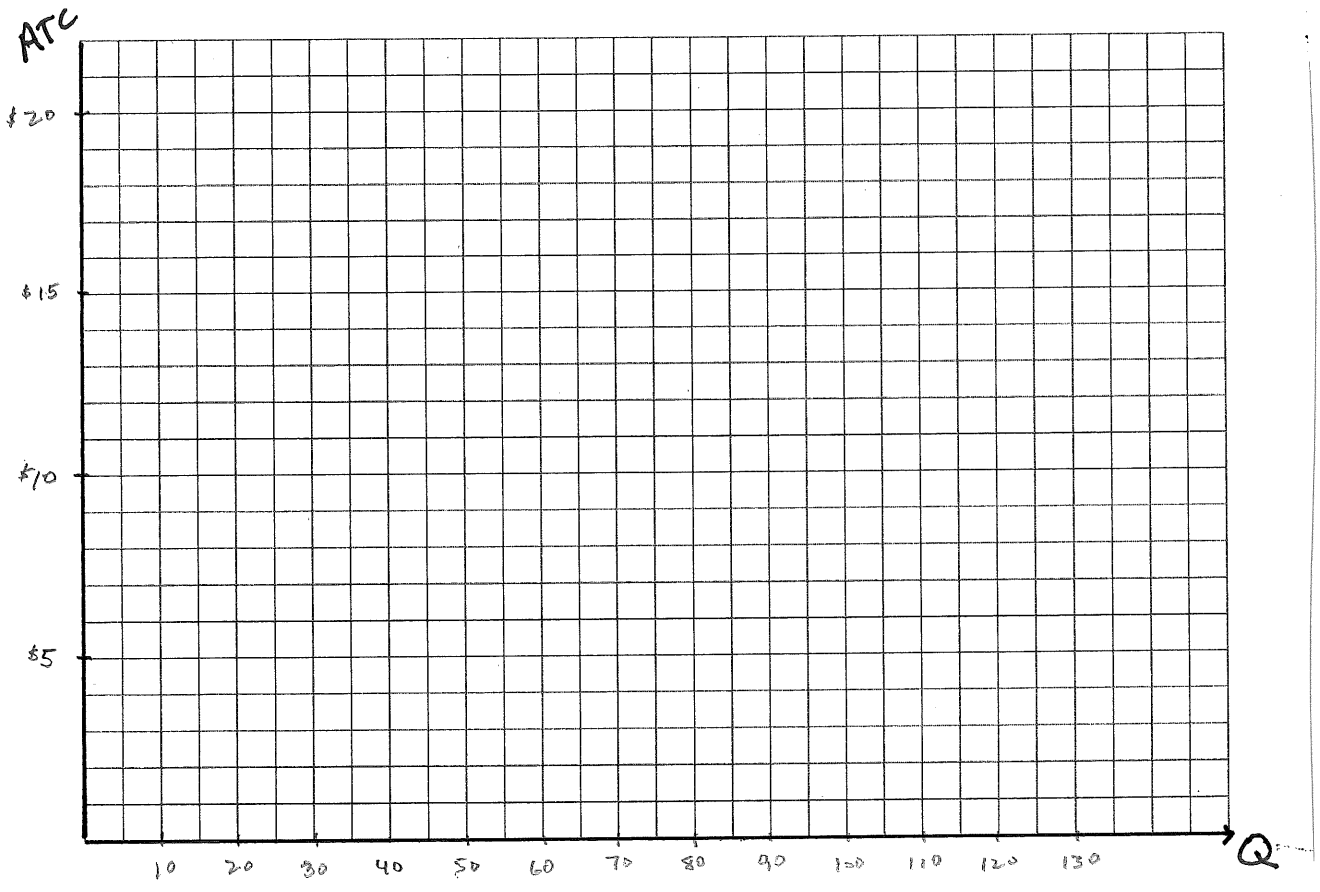
Esmeralda invites you to work alongside her for a while to help you assess other factors relevant to her business. You learn the following things. She works full time in her food truck but takes her compensation in the form of profits instead of paying herself a salary. Esmeralda owns her truck outright. Fully outfitted food trucks like hers cost $80,000 when new, and have an expected life of four years, at which point they are worth nothing. Prior to buying her food truck Esmeralda had the $80,000 parked in an indexed mutual fund where she earned 6%. What do you think of this business opportunity? Answer by calculating Esmeralda's economic profits (or losses), carefully explaining your logic.

4. (15 pts.) The following table describes the short-run production relationship for a firm that produces long-term nursing care. It operates nursing homes in a number of different communities. It produces a single output, Q, i.e. the number of patients housed in a given facility. It uses two inputs, L, healthcare workers, and K, physical facility and healthcare equipment. Suppose that the daily per unit price of L is $200 and the daily per unit price (implicit rental rate) of K is $200. Suppose the firm decides to build a small-sized nursing home in a particular community, i.e. it chooses K=1. Using information from the table, sketch the firm's short-run 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, that correspond to K being fixed in the short run at K=1.

		Labor Input				
		1	**2**	**3**	**4**	**5**
Capital Input	**1**	20	40	55	65	70
	2	40	60	75	85	90
	3	55	75	90	100	105
	4	65	85	100	110	115
	5	70	90	105	115	120



5. (15 pts.) The firm is considering building a new nursing home in community that currently does not have any long-term care facilities. It is wondering how its per patient costs vary with the scale of its operations. In other words, it wants to know whether there are economies or diseconomies of scale. Calculate and graph its short-run average total cost curves for K=1, K=3, and K=5 (you have already done the calculations for K=1). Then illustrate and explain what its long-run average cost curve (LRAC) looks like, and whether it experiences economies or diseconomies of scale.



6. (5 pts.) If the firm were considering entering a small market community that would likely only generate 40 patients at any point in time, what scale would you recommend and why? Use your diagram in the previous question in explaining your answer.

7. (10 pts.) On the "Make-or-Buy Continuum" which goes from arm's length market transactions to perform activity internally, explain where the relationship between chicken farmers and chicken processing plants falls and why, and then explain where the relationship between cattle farmers and beef processing plants falls and why. Knowing what you do about changes that occurred in pork production in the 1980s and 1990s, what sort of relationship would you expect between upstream pork farms and downstream pork processing plants?

8. (5 pts.) Using an algebraic expression, explain why Toyota outsources the audio systems in its Camrys to Bose.