

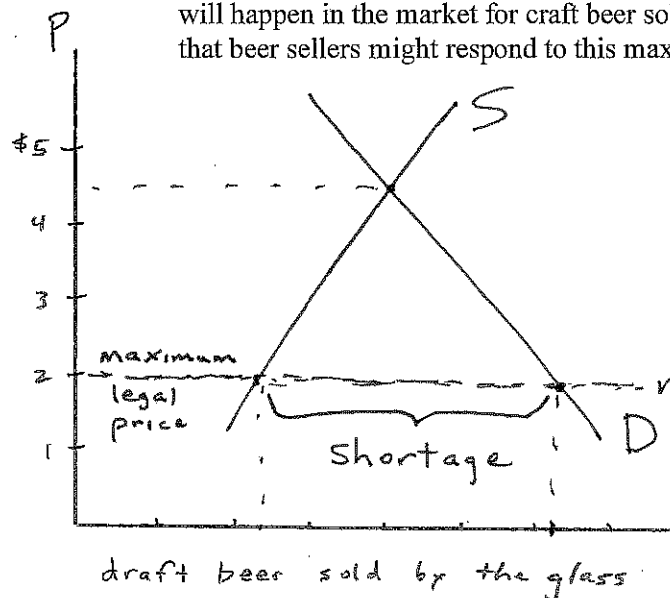
100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers.

- (10 pts.) A drought in California sharply reduces the carrot crop, causing a sharp decline in the amount of carrots available for U.S. households to consume. If the U.S. were a centrally planned economy, how would this reduction in carrot consumption be accomplished? The U.S. is not a command economy, but instead relies on markets to allocate resources. How will the necessary reduction in carrot consumption be accomplished? Your answer should incorporate things like incentives and the transmission of information.

In a pure centrally planned economy goods and services are allocated to households by the central planners. They would have to explicitly reduce the allotment to each household so that the sum of the amounts rationed to all households did not exceed the available harvest of carrots.

In a market system a reduction in the carrot crop would cause the price of carrots to rise. Each carrot consumer would learn about the increased scarcity of carrots when they observed prices rising at the grocery store. Households would be incentivized to individually adjust their carrot consumption according to their own willingness to pay for carrots vis-à-vis other goods. In aggregate the reduction in household demand for carrots would equal the available supply.

- (10 pts.) Taking their inspiration from Venezuela's late leader Hugo Chavez, Lexington's City Council decides to adopt consumer protection legislation aimed at preventing college students from exploitation by the city's bar owners. Toward that end, they impose a price ceiling on draft beer of \$2.00 per glass. They take this action after observing that most bars are charging between \$4 and \$5 for specialty craft beers like the East 6<sup>th</sup> and CityBoy brands. Illustrate what you think will happen in the market for craft beer sold on draft in Lexington. Then elaborate on other ways that beer sellers might respond to this maximum legal price.



A maximum legal price set below the market-clearing price would lead to a shortage of specialty craft beers sold on draft. If bars are currently charging \$4.50 for a 16 oz. glass of CityBoy beer, they will be forced to reduce their price to \$2.00 per glass. Beer drinkers will want to buy more glasses of beer than bar owners want to sell at that price. Enterprising bar owners may respond to this new ordinance by selling beer in 6 oz. glasses, only selling 32 oz. pitchers of draft beer, only selling very cheap brands by the glass, selling high-priced beer only in cans, etc. Another strategy might be to impose a cover charge and limit the number of glasses of beer any one person can drink.

3. (10 pts.) As the new general manager of Kentucky Kingdom amusement park, you decide to experiment with prices for the various products you sell. When you raise the price of admission from \$45 to \$55, average daily attendance falls from 7700 patrons to 6300 patrons. Calculate own-price elasticity of demand for admission to the park. Given the number that you calculate, will total revenues from admissions go up or down when you raise price?

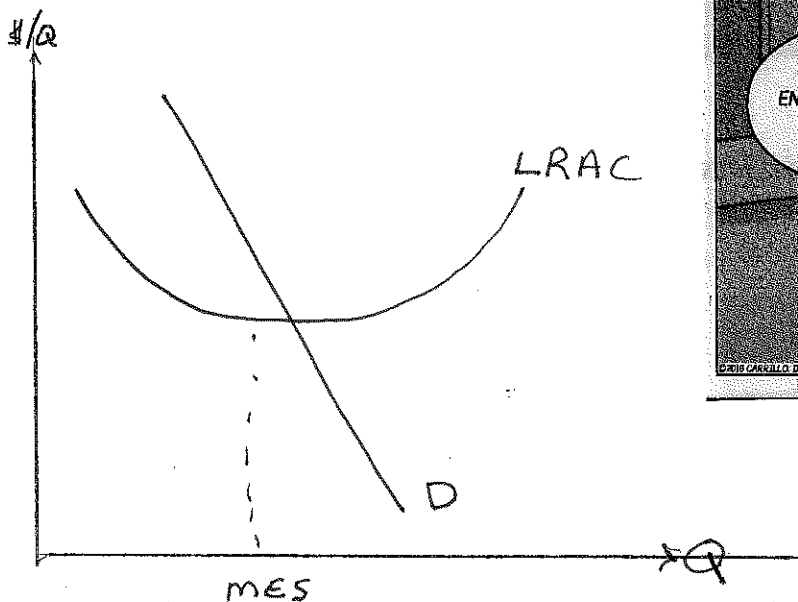
$$E_{X, P_x} = - \frac{\frac{7700 - 6300}{\frac{1}{2}(7700 + 6300)}}{\frac{45 - 55}{\frac{1}{2}(45 + 55)}} = \frac{\frac{1400}{7000}}{\frac{10}{50}} = 1$$

Percentage increase in price causes quantity demanded to fall by the same percentage. Total revenues from admissions will stay the same.

4. (5 pts.) One of your newly hired marketing analysts suggests to you that another important consideration in this pricing decision is that the cross-price elasticity between the price of admission tickets and sales of hot dogs, soft drinks, and souvenirs is -1.5. After you have tried this experiment for a month, will you consider it a success or go back to what you were doing before? Briefly explain why.

When you raise the price of admission by 20%, quantities sold of hot dogs, soft drinks, and souvenirs fall by 30%. Since you have not changed their prices, revenues from these items fall by 30%. If revenues from admissions do not change, while revenues from other sources fall by 30%, this seems like a failed experiment, especially if most of your costs of running the park are fixed in the short run. Go back to what you were doing before, and maybe even experiment with reducing the price of admission below \$45.

5. (10 pts.) Illustrate and briefly explain what is implied by the cartoon below about the market for upscale kitchenware shops in the town where the two cowboy entrepreneurs live.



Given the minimum efficient scale of upscale kitchenware shops, market demand is only sufficient to support one MES-sized firm, and not two.

6. (10 pts.) You are thinking about buying a plumbing supply business from one of your neighbors. Her business has a number of valuable assets which you have evaluated and placed a value on, such as building, equipment, a stable group of employees, and an established customer list and business goodwill. One thing that you are struggling with is how to value her considerable inventory of copper tubing, which you will own when you buy her business. She suggests that it would only be fair to use the historical wholesale cost for each inventory item, since copper prices have gone up and down quite a bit over the past several years. A friend of yours who just completed ACC 201 and got an A tells you to use either LIFO or FIFO, since both are GAAP-approved approaches. Neither of them has an MBA, however. What do you think?

The value of the inventory of copper tubing that sits in the warehouse is determined by what it would cost you to replace it at current wholesale prices. If you purchase this business, then as you sell copper pipes to plumbers you will need to call your supplier and replace it so that you have sufficient inventory to meet your customers' needs. Historical values are not relevant for this decision—current replacement costs are. (If you can get her to sell you her inventory at some price below that level, more power to you.)

7. (10 pts.) You decide to drop of the MBA program and return to work on your family's farm, growing soybeans. It is spring, and you need to plow the fields in order to plant a new crop of beans. You are currently using a medium-sized tractor that you rent by the day from another farmer, and you have hired a worker to drive the tractor and plow the fields. Your neighbor has a larger tractor which you could rent for 50 euros per day more than you are currently paying for the medium-sized tractor. With the larger tractor you could plow 4 hectares more land in the same amount of time. You are currently employing the worker for eight hours each day. If you continued to use the medium-sized tractor but had the worker plow for an additional hour, you would have to pay 10 euros in additional wages, but 2 more hectares would get plowed. Are you using labor and capital efficiently? Use an equation to discuss whether you are using the efficient mix, or whether you should use either more labor and less capital or more capital and less labor.

Efficient input mix:  $\frac{MP_L}{w} = \frac{MP_K}{v}$

$$MP_L = 2 \text{ hectares} \quad MP_K = 4 \text{ hectares}$$

$$w = 10 \text{ €} \quad v = 50 \text{ €}$$

$$\frac{MP_L}{w} = \frac{2}{10} > \frac{MP_K}{v} = \frac{4}{50}$$

$$.2 > .08$$

Another Euro spent on labor gets you an additional 0.2 hectares plowed. Another Euro spent on capital gets an additional 0.08 hectares plowed. Your current input mix is overly capital-intensive.

8. (15 pts.) The following table describes the short-run production relationship for a firm that produces a single output,  $Q$ , with two inputs,  $L$  and  $K$ :

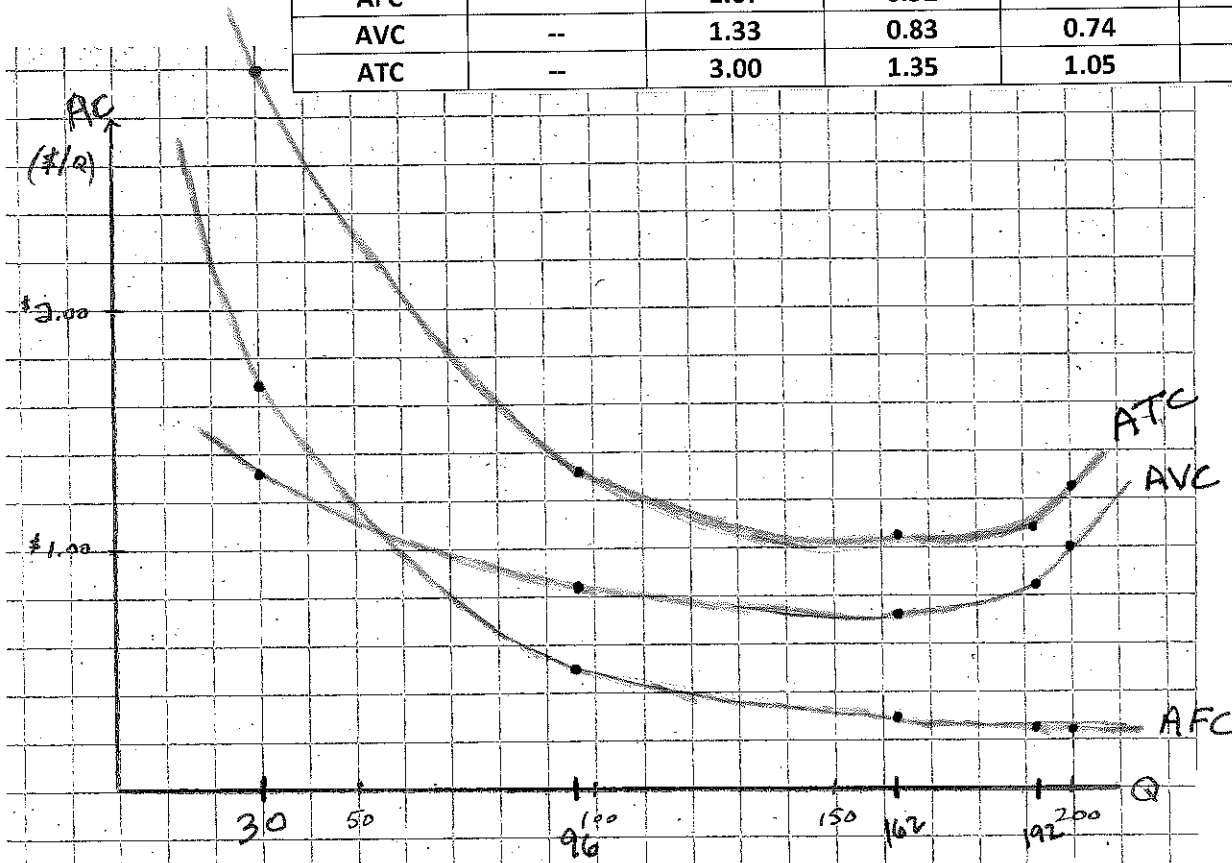
<b>K</b>	10	10	10	10	10	10
<b>L</b>	0	8	16	24	32	40
<b>Q</b>	0	30	96	162	192	200

$$TFC = v \cdot \bar{K}$$

$$TVC = w \cdot L$$

Suppose that the wage rate is \$5 and the rental rate on each unit of capital is \$5. Sketch the firm's average fixed cost, average variable cost, and average total cost curves in the diagram below.

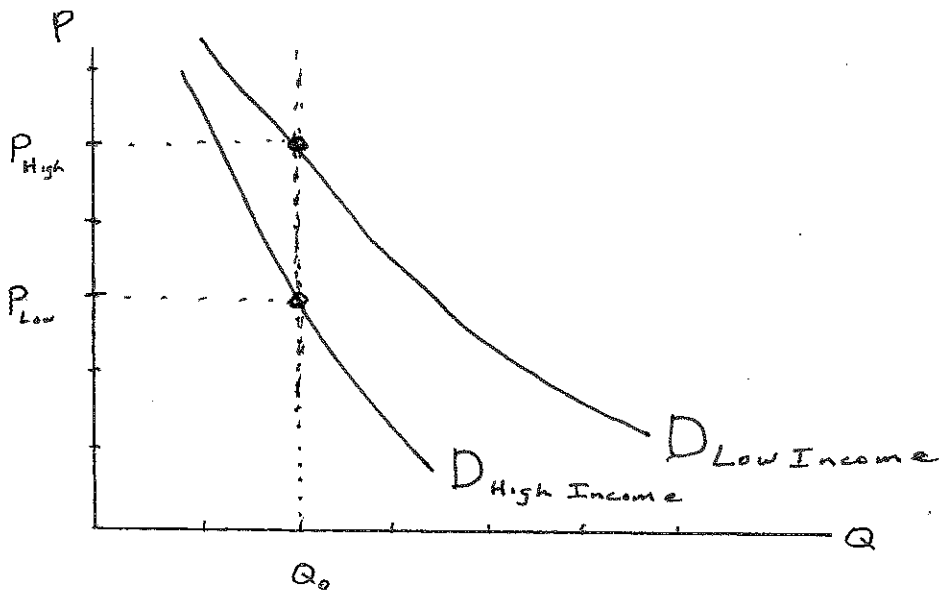
<b>TFC</b>	50	50	50	50	50	50
<b>TVC</b>	0	40	80	120	160	200
<b>TC</b>	50	90	130	170	210	250
<b>AFC</b>	--	1.67	0.52	0.31	0.26	0.25
<b>AVC</b>	--	1.33	0.83	0.74	0.83	1.00
<b>ATC</b>	--	3.00	1.35	1.05	1.09	1.25



9. (5 pts.) Does the shape of this average total cost curve illustrate that the firm experiences economies of scale?

The short-run average total cost curve is always U-shaped. Its shape reflects declining average fixed costs over low levels of output, a bottoming out at the designed operating capacity of the fixed capital input, and increasing average variable costs (and marginal costs) as output is further increased and the law of eventually diminishing marginal returns starts to bite. Economies of scale is a long-run concept, wherein both labor and capital are variable. Economies and diseconomies of scale refer to the shape of the long-run average cost curve.

10. (15 pts.) PepsiCo decides to add Ramen Noodles to its product line. You are selected to be the brand manager. Before going national with the introduction of this new product, you get the marketing research department to conduct some field tests to get a feel for the demand curve. They come back with the following report. When they set a high price at the Euclid Ave. Kroger store, a neighborhood populated by lots of UK students, demand per household was  $Q_0$ . When they set a low price at the Hartland Kroger, a neighborhood populated with relatively high-income households, demand per household was roughly the same,  $Q_0$ . From this they concluded that consumers are very insensitive to changes in price for this product and the demand curve is practically vertical, since own-price elasticity of demand was near zero. Critique the marketing experiment that they conducted, bringing into your answer concepts we have studied in this class. Using demand curve concepts, illustrate what is going on in the diagram below.



This experiment would not win you a ribbon at a 7<sup>th</sup>-grade science fair, for you have not followed the scientific method. Both price and income level are being varied at the same time, so you have not identified two points on the same demand curve. If Ramen Noodles are an inferior good, then the demand curve in the high-income neighborhood will lie to the left of the demand curve in the low-income neighborhood. To estimate own-price elasticity of demand you should vary price at the same store, so that other factors such as income or tastes that influence demand are held constant. To estimate income elasticity of demand, you should hold price constant across stores and see how demand varies between low-income and high-income neighborhoods.