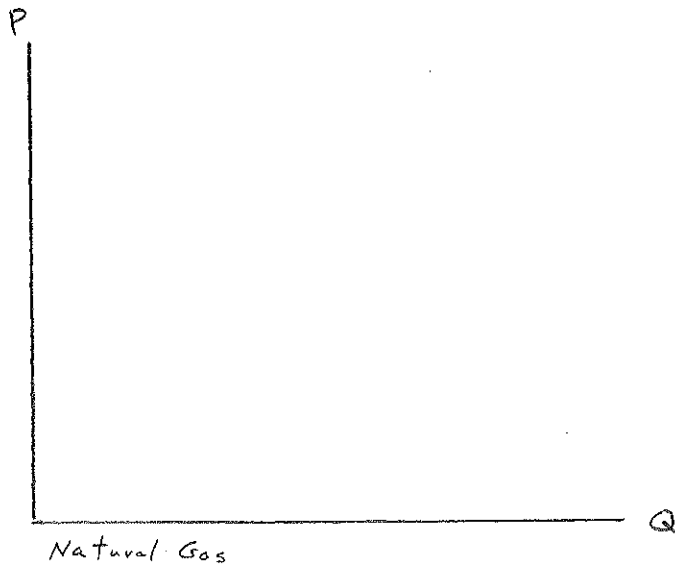


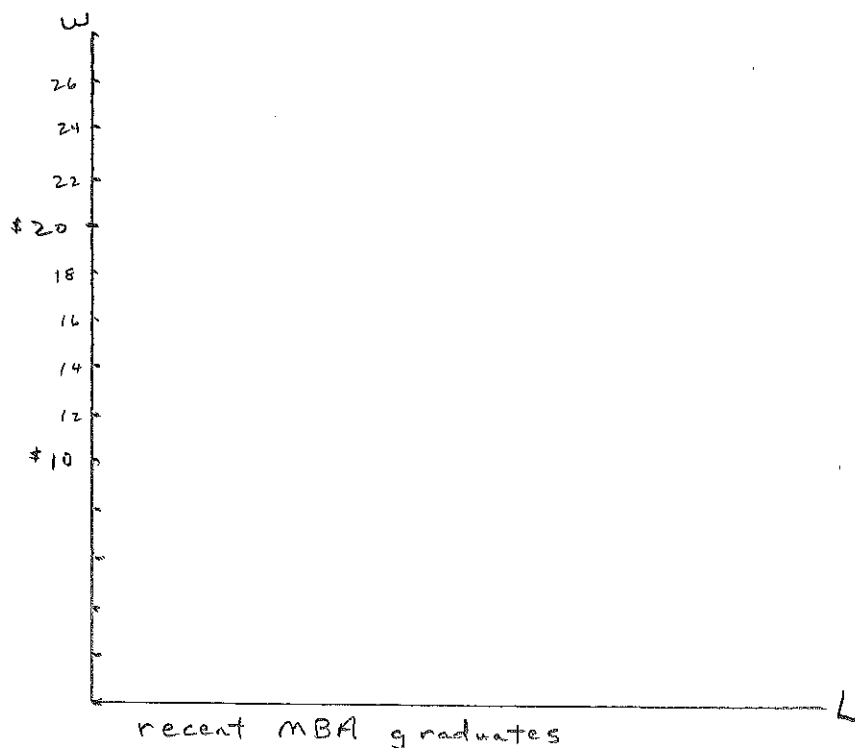
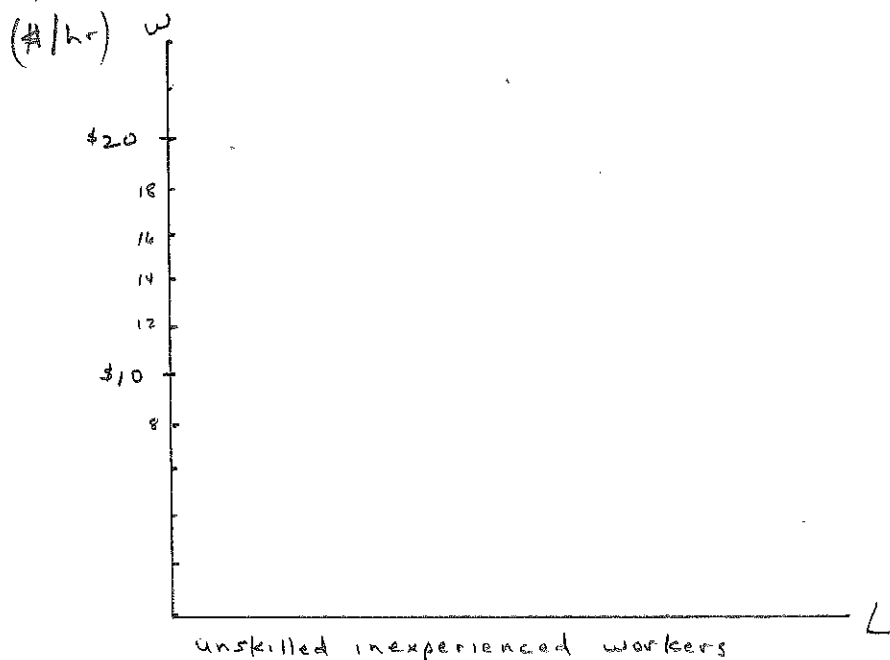
100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers.

1. (10 pts.) Saudi Arabia and Russia, two major players in the world market for crude oil, decide to ramp up production, sending oil prices downward. In North Dakota and Texas in the U.S., many oil wells have an associated product, natural gas, that bubbles to the surface alongside the oil being extracted. Briefly explain and illustrate in the diagram below the effect of falling oil prices on the market for natural gas.



2. (10 pts.) We have discussed two different lines along which economic systems can be classified. We also watched a short video clip explaining how agriculture in China works. How would you categorize the Chinese system of agriculture according to each of the classification approaches? Briefly explain both the two taxonomies and how Chinese agriculture fits into each.

3. (10 pts.) Citing their concern for the well-being of low-income households, Seattle's city council implements a series of increases in the citywide minimum wage from \$9/hour to \$11/hour (last year) to \$13/hour (this year) to \$15/hour (next year). If they were to have asked you for your assessment of the impact of such a policy on different labor markets, what would you have told them? Explain and illustrate the impact of imposing a \$15/hour minimum wage on the labor markets for (1) unskilled, inexperienced high school students looking for a summer job, and (2) recent graduates of good MBA programs.



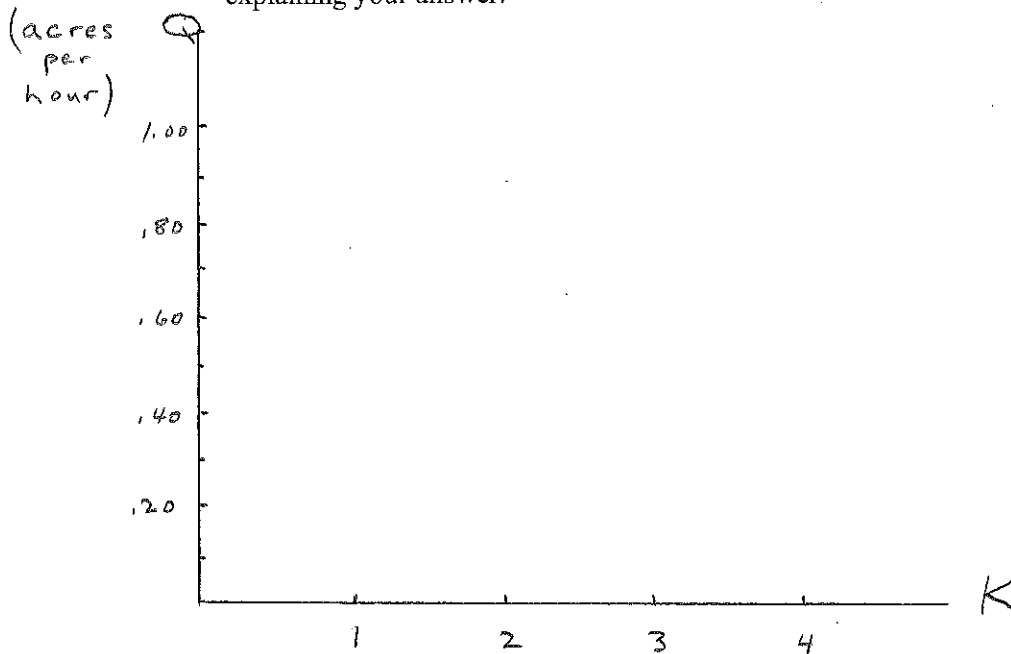
4. (15 pts.) Lexington's city council decides to try to improve social well-being in a different way—combating obesity by reducing the caloric intake of its citizens. A citywide tax on carbonated soft drinks sweetened with sugar is implemented, raising the price of (for example) name-brand beverages like Coke and Pepsi from \$4 to \$5 for a 12-pack of 12 oz. cans. Grocery stores and other sellers experience a 35% decline in sales.

a) Calculate own-price elasticity of demand for sugary soft drinks.

b) The cross-price elasticity of demand between sugary and diet soft drinks is 0.7. How much extra shelf-space will be allocated to diet carbonated beverages in grocery stores after the sugar tax is imposed? Briefly explain your answer.

c) The income elasticity of demand for sugary soft drinks is -0.2. Will this tax fall more heavily on low-income or high-income households? Briefly explain.

5. (10 pts.) You have bought a new house with a one-acre lot that has to be mowed on a regular basis. You plan on doing the job yourself, but need to buy a lawn mower. After some research you figure out the following: If you buy a push reel-type mower ( $K=1$ ), you can mow one acre of grass in five hours (300 minutes). If you buy a gas-powered push mower ( $K=2$ ), you can mow one acre in two hours (120 minutes). Your labor combined with a gas-powered self-propelled mower ( $K=3$ ) gets an acre of grass mowed in 80 minutes. You sitting on a small lawn tractor ( $K=4$ ) accomplishes the one-acre job in 70 minutes. Do you see the law of eventually diminishing marginal returns at work in this production experiment? To fully explain your answer, you should keep the labor input fixed at one person-hour, and calculate how many acres of grass one person-hour of  $L$  can produce when combined with increasing amounts of  $K$ . Illustrate in the diagram below and refer to your graph in explaining your answer.

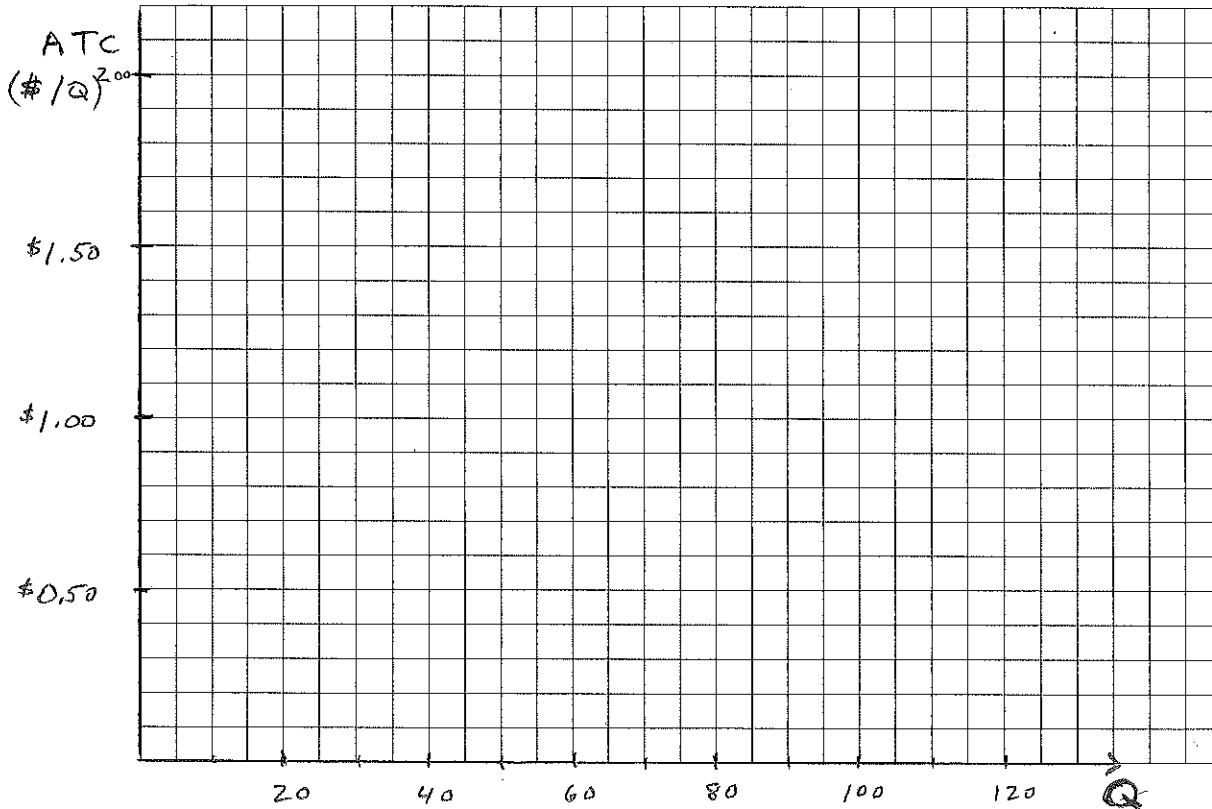


6. (10 pts.) You decide to go with the small lawn tractor, but before you buy it the owner of a landscape company approaches you and offers to mow your grass for the entire season for \$1500. Another decision to make! You can purchase a small lawn tractor for \$1000. After using it for a season you could sell it for \$750. You anticipate spending \$100 for gas, oil, and maintenance on the mower for the season. You would have to take the purchase price out of your Credit Union account where it is earning 5%. If you mow your own yard, you can count on spending 20 hours keeping your grass cut until it stops growing sometime in mid-November. You value your leisure time at \$50 per hour. Your neighbor, who makes twice as much money as you do, highly recommends the landscape company. What is right for you?

7. (15 pts.) Labor and capital are used to produce widgets according to the production table below:

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

Per unit-prices for labor and capital are  $w = \$20$  and  $v = \$20$ . For this particular production function, when both input prices are the same, the long-run least-cost combination of inputs occurs where  $K = L$ . Using this information, graph five points on this firm's long-run average cost curve in the diagram below. Be sure to point out if there are economies or diseconomies of scale, and indicate the minimum efficient scale of production.



8. (10 pts.) Suppose you have chosen  $K = 2$  and are stuck with that plant size in making short-run production decisions. If you want to produce  $Q = 40$ , how would you do it and what would your per-unit costs be? If you wanted to produce  $Q = 90$ , how would you do it and what would your per-unit costs be? Graph these two points on the firm's short-run average total cost curve for plant size  $K = 2$ .

9. (10 pts.) We discussed six product and plant-level reasons why a firm might experience economies of scale. Briefly discuss each (five will get you full credit.)