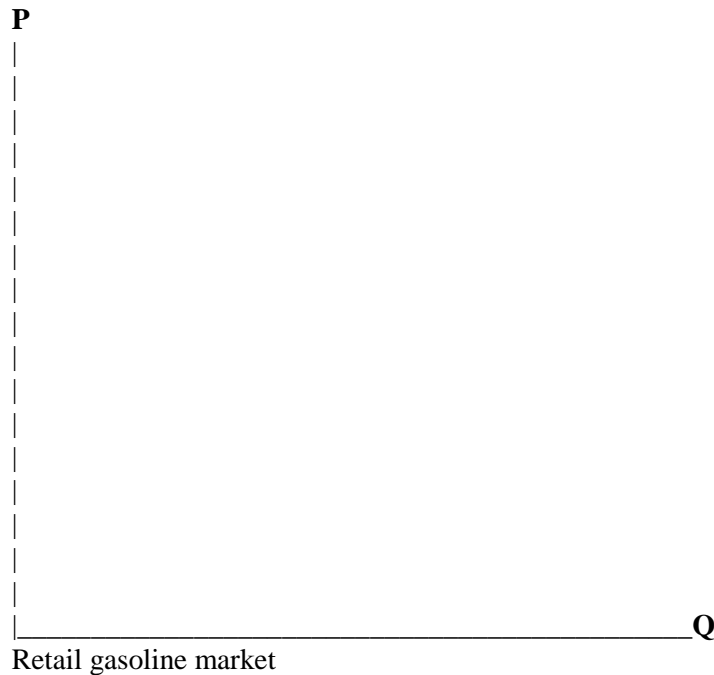


100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers.

1. (10 pts.) Story line from the *Lexington Herald-Leader* several weeks ago: “OPEC oil ministers announce a significant increase in production just as the summer driving season begins in the U.S.” (Summer driving season refers to families taking vacations in their cars.) Two things are happening simultaneously that likely will affect the retail market price and market output for gasoline in the U.S. Using supply and demand analysis, illustrate and explain what you think will happen in retail gasoline markets. Can you say with certainty whether equilibrium price will rise or fall? Whether equilibrium quantity will rise or fall?



2. (5 pts.) “Subaru’s Got a Big Problem: It’s Selling Too Many Cars.” (WSJ, 8/21/13) Was Subaru’s problem due to the law of diminishing returns or because of diseconomies of scale? Briefly explain.

3. (15 pts.) Different countries answer the three basic economic questions in different ways. Briefly explain the three basic questions and the two different types of economic systems. Then describe in which direction North Korea seems to be heading, and in which direction Venezuela seems to be heading.

4. (5 pts.) If $Q = 6$, $AFC = 20$. If $Q = 3$, then $ATC = 70$. What is TVC if $Q = 3$?

5. (20 pts.) As supervisor of an Amazon fulfillment center, you oversee a production process that has three primary factors of production: (1) a warehouse of given size and configuration, which we will take as fixed over the time period under consideration; (2) humans, who stand at work stations where they pack boxes with items that robots bring to them; and (3) robots, who travel around the warehouse picking out shelves containing items that people like me have ordered online. You are pondering whether the mix of humans (L) and robots (K) under the current configuration is optimal i.e. minimizes cost. Currently there are twenty work stations with one human at each one and one hundred little orange robots motoring around the warehouse bringing things to the humans. With this mix you are able to process 500 orders (Q) per hour on average. Having observed productivity when the number of humans is increased or decreased by one and when the number of robots is increased or decreased by one, you have put together the following productivity matrix:

		Robots (K)		
		K = 99	K = 100	K = 101
Humans (L)	L = 19	Q = 475	Q = 480	Q = 484
	L = 20	Q = 495	Q = 500	Q = 504
	L = 21	Q = 512	Q = 518	Q = 523

Now for the question: If the total compensation you have to pay humans is \$20 per hour, and the lease rate on robots is \$10 per hour, what do you think about the mix of labor and capital under your current configuration? Too much of one and not enough of the other? Just right to minimize costs? Explain your reasoning, and show the formula you use in arriving at your answer.

As an alternative way of expressing the logic of your answer, calculate the marginal cost of increasing output by one order per hour by adding another unit of labor and compare it to the marginal cost of increasing output by one order per hour by adding another unit of capital.

6. (15 pts.) The Kentucky Lottery Commission asks you to conduct some marketing research for them. They would like to know the income elasticity of demand for instant scratch-off lottery tickets. You find that when looking across consumers, households with average annual incomes of \$40,000 spend roughly \$100 per year while households with average annual incomes of \$60,000 spend roughly \$80. Calculate the income elasticity of demand for lottery tickets, showing your work.

Out of curiosity, looking at expenditures on college education across the same two income groups, you find that 35% of children in the lower income group attend college after high school, while 45% of the higher income group attend college. Calculate the income elasticity of demand for college education, showing your work.

What kind of good are lottery tickets? What kind of good is higher education?

7. (15 pts.) Your sister is contemplating buying a bakery that specializes in cupcakes. She shares the most recent income statement that she obtained from the owner, and asks for your opinion. It reflects annual revenues of \$250,000. Costs include materials and supplies of \$50,000, wages for hourly employees of \$80,000, insurance and taxes of \$20,000, and utilities of \$30,000. The sale price of the bakery business is \$300,000, which includes the building, equipment, and property. To buy this business your sister proposes to cash in her mutual fund (long-run expected rate of return = 6%). She would also have to quit her current job where she earns \$60,000 managing a local restaurant. (a) Calculate the accounting profits for this business. (b) Calculate the economic profits from this business, explaining how and why they differ from the accounting profits. (c) After listening to your reasoning, your sister decides to quit her job, cash in her mutual fund, and go into business for herself baking cupcakes. What does that tell you about the value your sister places on being her own boss?

