

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.) Tom worked for many years as manager of a Cracker Barrel Restaurant, earning an annual salary of \$100,000. Finally growing tired of working for other people, he decides to open his own restaurant on High Street in Lexington, specializing in southern comfort food and drink. He borrows \$500,000 to buy and equip a building for his restaurant, \$300,000 of it coming from his retirement savings (where it had averaged 5% per year in growth) and \$200,000 of it coming from a bank loan (borrowed at an annual rate of 7%). The restaurant grosses \$850,000 in sales each year. Tom incurs wage and salary expenses for his employees of \$250,000, wholesale costs of food items of \$350,000, and utilities, taxes, insurance, and other assorted expenses of \$130,000. Tom doesn't pay himself a salary, but collects the profits from the business since he is the sole owner. After he has owned and operated this business for several years, you ask him if he is happy with his decision. He says that he has no regrets at all, preferring this to his next best alternative. How much does Tom value being his own boss? Hint: calculate Tom's economic profits.

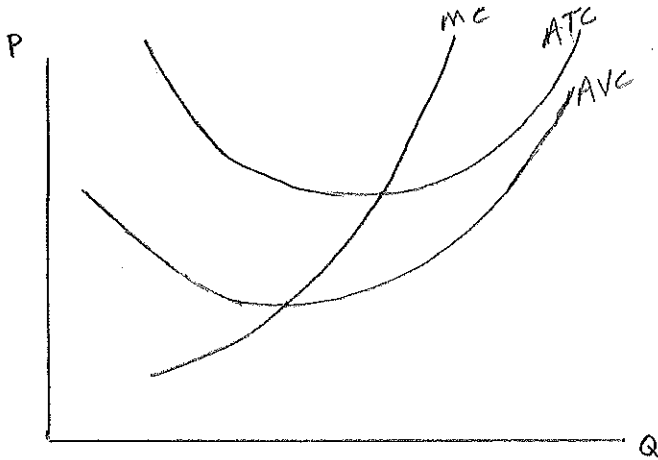
2. (5 pts.) Refining capacity (in 1,000 barrels per day) of the major petroleum refiners in the U.S. are given below:

a. Valero	1,904
b. Exxon Mobil	1,856
c. Marathon	1,714
d. Phillips 66	1,591
e. Motiva	1,073
f. Chevron	943
g. Tesoro	834
h. Citgo	763
i. Koch Industries	690
j. BP	649

There are many smaller refineries in addition to these, but for purposes of answering this question you can ignore them. Compute the HHI for the petroleum refining industry.

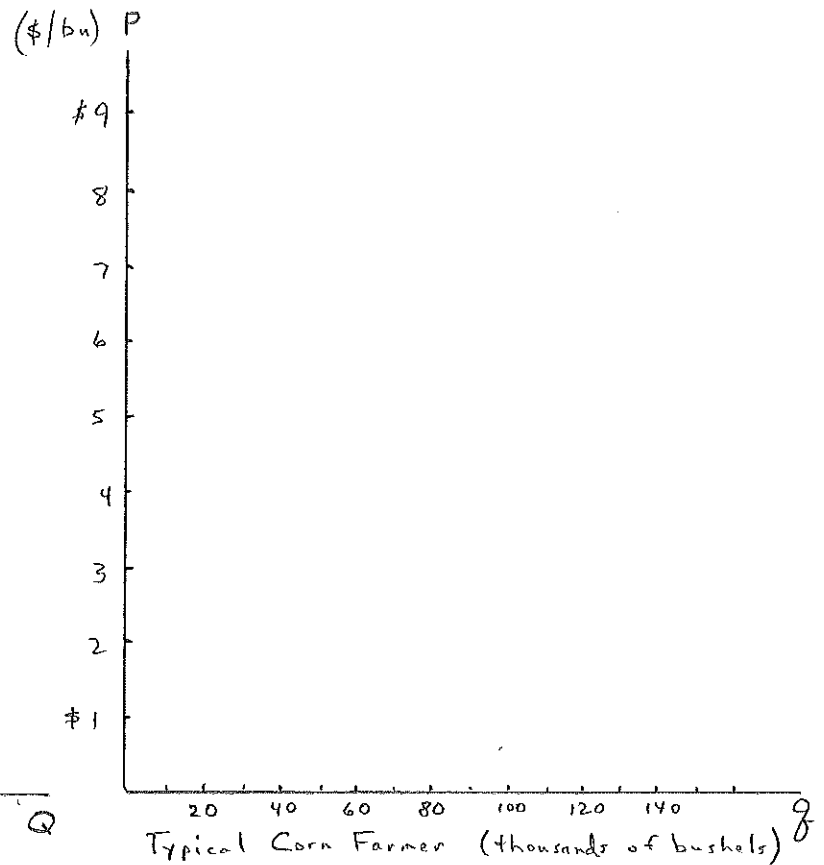
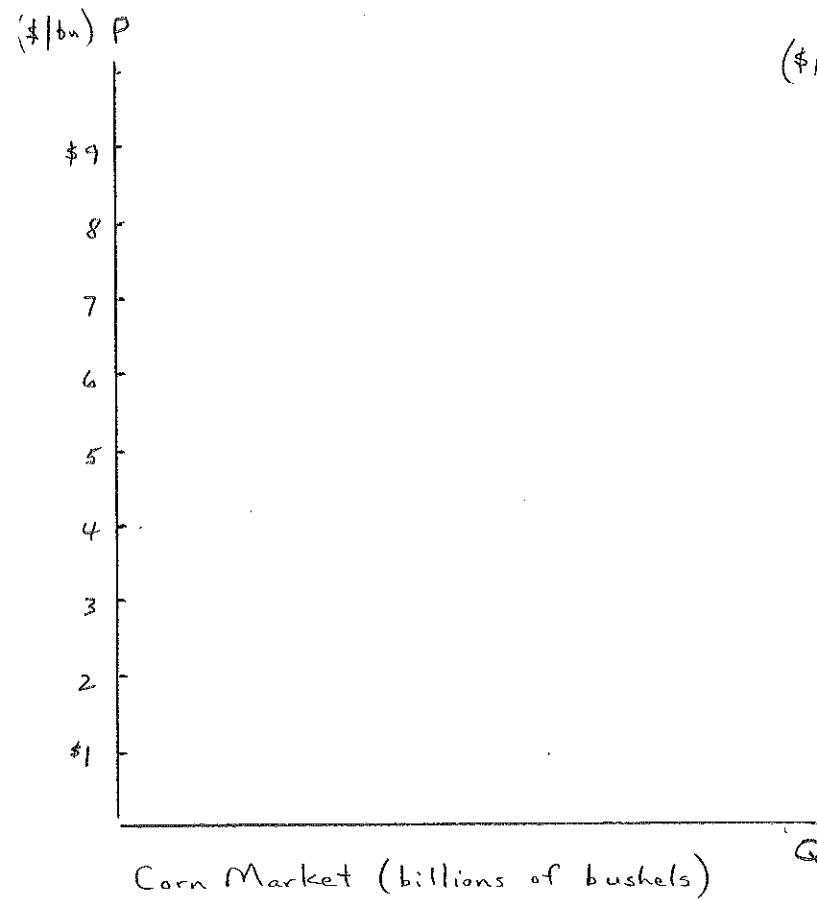
3. (6 pts.) TWC, the local cable TV monopolist, charges \$15 per month for their HBO premium movie package of channels. HBO charges TWC \$5 for each subscriber. TWC has done its homework, and is confident that it is charging the profit-maximizing price. If they are correct, calculate own price elasticity of demand for the HBO channels.

4. (9 pts.) Shown below are the AVC, ATC, and MC curves for one of several miniature golf courses in a large beach resort. Illustrate and label demand curves consistent with each of the following situations. Briefly explain your answers:
- $D_1$ : It is wintertime and when we drive by the golf course, a sign says “closed for the season.”
  - $D_2$ : It is springtime and the golf course is open. The owner tells us that she couldn’t survive if business were like this all year round.
  - $D_3$ : It is the peak of the season, the parking lot is full, and the owner has a smile on her face.

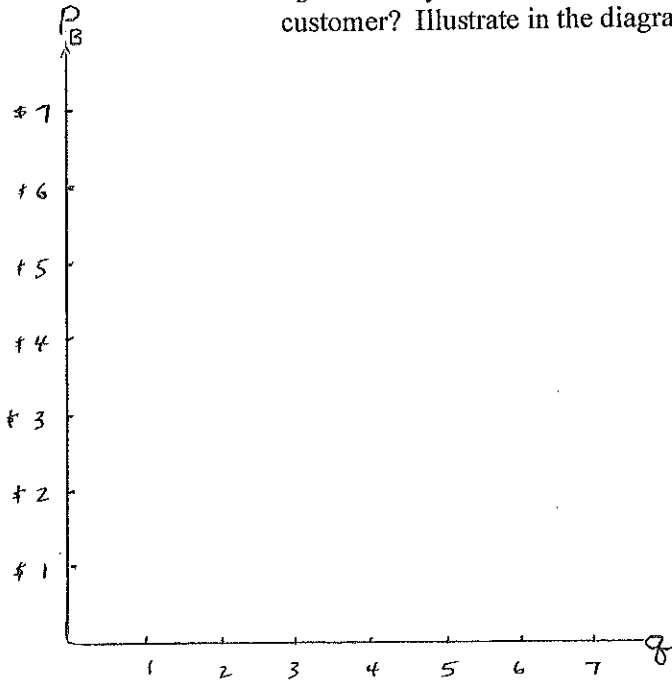


5. (8 pts.) RE *WSJ* 2003, “Cruise Lines . . . as War Fears Rattle Travelers.” Using Porter’s five forces model, discuss the nature of the economic rivalry among cruise ship firms operating in the European/Mediterranean market in the early 2000’s.

6. (13 pts.) The inflation-adjusted price of corn was steady at \$4 per bushel through the early 2000's. Then in 2005 Congress passed a law that provided significant subsidies for the production of ethanol, produced using corn. Demand for corn increased dramatically, and the price of corn rose to over \$7 per bushel by 2007. It stayed there for a couple of years, and then started to fall. By 2010 the price per bushel was back to \$6, and more recently (2014) the price has returned to the \$4 per bushel range. While the output of individual corn farmers has risen and fallen over that period and the number of corn farmers has changed, the average farm size (in terms of number of acres) has not changed. In the diagram below on the left, draw the market demand and supply curves for 2005, 2007, 2010, and 2014. Be sure to label them. In the diagram on the right, draw the ATC and MC curves for a typical corn farmer, and illustrate their profit position in 2007. Factoid: the average size = 600 acres, and average output per acre = 150 bushels of corn.

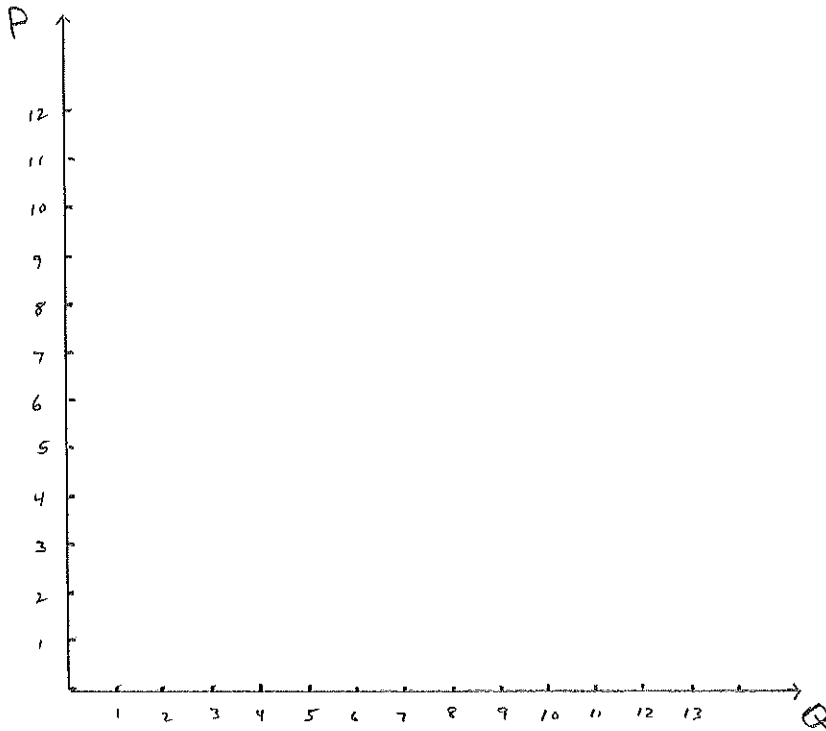


7. (24 pts.) You own and operate a bar close to the UK campus. After some experimentation, you determine that the typical male patron has the following demand for beer:  $q = 5 - P_B$ .  $P_B$  is the price per beer and  $q$  is number of beers each male patron chooses to consume on any given visit to your bar. Your costs for beer are  $MC = AC = \$1$ .
- What price per beer will maximize profit, how many beers will each patron consume, and what will you earn on each customer? Illustrate in the diagram below.
  - Now, suppose you can charge an entry fee or cover charge to get in the bar. Would you set  $P_B$  differently? What cover charge would you set? What profits will you earn on each customer? Illustrate in the diagram.



- Finally, let's consider how your overall pricing strategy affects the number of customers who come to your bar. Suppose  $F = 50 - 10CV_F$  and  $M = 35 + F - 5P_B - 2CV_M$ , where  $F$  is the number of female customers,  $M$  is the number of male customers,  $CV_F$  is the cover charge for female patrons, and  $CV_M$  is the cover charge for male patrons. Discuss conceptually (don't calculate) how you might take these interactions into account in setting the price for beer and the cover charges for males and for females. Why might setting different beer prices for males and for females be problematical?

8. (25 pts.) You live on a small island in the Aegean Sea. The island has considerable tourist potential, except that it only gets ferry service once a week. You have done research on tourism for similar Greek islands, and you have estimated that demand for hotel rooms on this island would be  $Q = 10 - P$ , if only the ferry came every day instead of once per week.  $Q$  is the number of hotel rooms demanded by tourists each night, and  $P$  is the price per room. Assume that marginal costs are constant at 2 per room per night ( $MC=AC=2$ ).
- a) Suppose that the Blue Star Ferry Line announces that it will begin providing daily service to your island. If you could be guaranteed a monopoly position in this market (not outside the realm of possibility since the island governing council is dominated by your close relatives), how big of a hotel would you build, i.e. how many rooms? Hint: calculate the profit maximizing price and quantity. What would your profits be?



b) Now suppose that the island governing council decides to grant operating licenses to two hotels, yours and one proposed by your cousin. You have never been able to fully trust your cousin, and now you are aligned against him in a simultaneous-move game—you both have to decide how much capacity (how many rooms) to build into your hotels. You have narrowed your viable choices to 2, 3, or 4 rooms. Your cousin has the same options in building his hotel. The following payoff matrix lays out the possible strategies and payoffs:

		You		
		Q = 2	Q = 3	Q = 4
Your cousin	Q = 2	8, 8	5, 9	4, 8
	Q = 3	9, 5	6, 6	3, 4
	Q = 4	8, 4	4, 3	0, 0

If you and your cousin each have to make your capacity choice simultaneously, what will be the likely outcome of this game? Explain your reasoning.

- c) Instead of you and your rival moving simultaneously, suppose instead that your cousin is getting his MBA in the U.S.A. and won't be home to start his hotel for another year. So you have the opportunity to make your capacity choice and build your hotel before he gets back, and then he will make his capacity decision second after you have made the first move. Based on the information in the above payoff matrix, write out the game tree for this sequential-move game. What will be the outcome of the game? Briefly explain.

- d) Draw the profit possibilities frontier for this market in the diagram below, where your cousin's profits are measured on the vertical axis and your profits are measured on the horizontal axis. Illustrate the three possible outcomes you have just analyzed in your diagram.

