

Review Problems for the Second Exam

1) Thirty years ago, most books in the U.S. (other than college text books) were purchased from small independent book stores. Since then, most small independent stores have been driven out of business by large chains of retail bookstores like Barnes and Nobel and Borders.

During the late 1990s, some internet analysts predicted that the ability to sell books over a web site would cause a big revival of small book sellers (now selling over the web rather than through stores). In fact, it appears that internet book sales are also dominated by a few large sellers like Amazon.com, BarnesandNobel.com and Borders.com.

a) Explain the most likely reason why large bookstore chains were able to drive small independent bookstores out of business. **Briefly** describe the chains' economic advantages.

b) When analysts predicted that the web would improve the competitive position for small booksellers, they focused on the fact that it is cheap to set up a web site - i.e. anyone can do it. In three or four sentences, give two reasons why this fact was insufficient to keep a few large sellers from dominating internet book sales.

c) If I want to buy a really obscure book - say, *300 Delicious Ways to Cook Reindeer Meat* - I know I can probably find that book on the web. I also know that I am only likely to find it on the web site of a very specialized bookseller - www.FinnishReindeer.FI - rather than on Amazon. Can this fact be reconciled with the domination of internet book sales by a few large sellers? Briefly explain.

2) Suppose computer floppy disks are produced in a perfectly competitive industry in which each firm has the same, standard U-shaped average cost curve, etc. Suppose further that this industry is in long run equilibrium such that floppy disks cost \$.75/disk.

a) Given the description above, draw the position of the typical firm in the industry showing relevant cost curves, the demand curve as the firm sees it, etc.

b) Carefully describe the amount of market power this representative firm possesses. In your answer, explain what market power means in this context.

c) Suppose that the rising price of oil causes an increase in the price of plastic which, in turn, causes the production cost of a floppy disk to rise by \$.10 per disk at all levels of production. Using words and diagrams explain what, if anything, will happen to the price that consumers ultimately pay for consumer disks. Does your conclusion here seem to contradict your answer in (b)? If so, revolve any apparent contradiction.

3) When a new town is established, a firm that wants to supply telephone service to the new businesses and homes require a very big initial investment to lay the main wires, to set up switching networks, etc. Once the large initial investment is made, connecting businesses and homes can be done at a very low additional cost per user.

a) Using words and diagrams, describe and draw the marginal and average cost curves suggested by this description for a firm that wants to sell telephone service. Assume that

b) Given the cost curves you drew in (a), is it likely that the telephone industry can reach an equilibrium if the industry is to be run as a monopoly? Use words and graphs to explain your reasoning.

c) Suppose it is **not** possible for Firm A to send calls over Firm B's lines so that each firm has to string its own lines. Given the cost curves you drew in (a), is it likely that the telephone industry can reach an equilibrium if the industry is to be run as a set of perfectly competitive firms? Use words and graphs to explain your reasoning.

4) The Shady Acres Nursing Home is the only nursing home in the town of Duxbury. The director calculates that each patient costs the center \$50.00 per day including food linens, etc. The home has a maximum capacity of 150 residents.

Shady Acres faces two kinds of demand for admission. The first is from private patients who will pay for the nursing home from their own funds or private insurance. Their demand is described by the demand curve:

$$P = \$200 - Q \text{ (where } P \text{ is the rate per day which private patients pay and } Q \text{ is the number of private patients admitted)}$$

The second source of demand comes from patients covered by the state's Medicaid program for low income citizens. Medicaid pays a flat fee of \$60.00 per day for each Medicaid eligible who is admitted. 275 Medicaid patients are now waiting for admission. State law permits the nursing home to set a price for private patients that differs from the \$60.00 per day it must charge for Medicaid patients.

a) Assume for a moment that there are no Medicaid patients. How many private patients would Shady Acres admit and what price would it charge them to maximize its profits. If the profit-maximizing strategy requires leaving some capacity empty, explain why.

b (15 points) Now consider the private patients and the Medicaid patients together. Calculate Shady Acre's profit maximizing strategy including the number of private patients it admits, the price the private patients pay, and the number of Medicaid patients it admits. Explain why it does or does not make sense for the nursing home to admit a different number of private patients in this case than it admitted in (a).

5) The town of Carencro, Louisiana recently built a bridge over Bayou Teche. The monthly demand function for trips across the bridge can be written:

$$\text{Trips per Month} = 5,000 - 1000P$$

where P is the toll (price) per trip.

When the bridge first opened, the city council chose to charge no toll and assumed the bridge would be funded entirely from other tax revenues. After several months, City Counselor LaFourche made the following argument:

“Because this bridge is a government project, the correct measure of benefits should sum consumer surplus and any revenues generated by bridge tolls. If we were to charge a modest \$1.00 per trip, we would get monthly revenue of \$4,000 which, when added to the consumer surplus, would represent a substantial increase in benefits over the current situation.”

Analyze LaFourche’s statement, explaining the parts with which you agree and disagree. Illustrate your answer with an appropriate diagram.

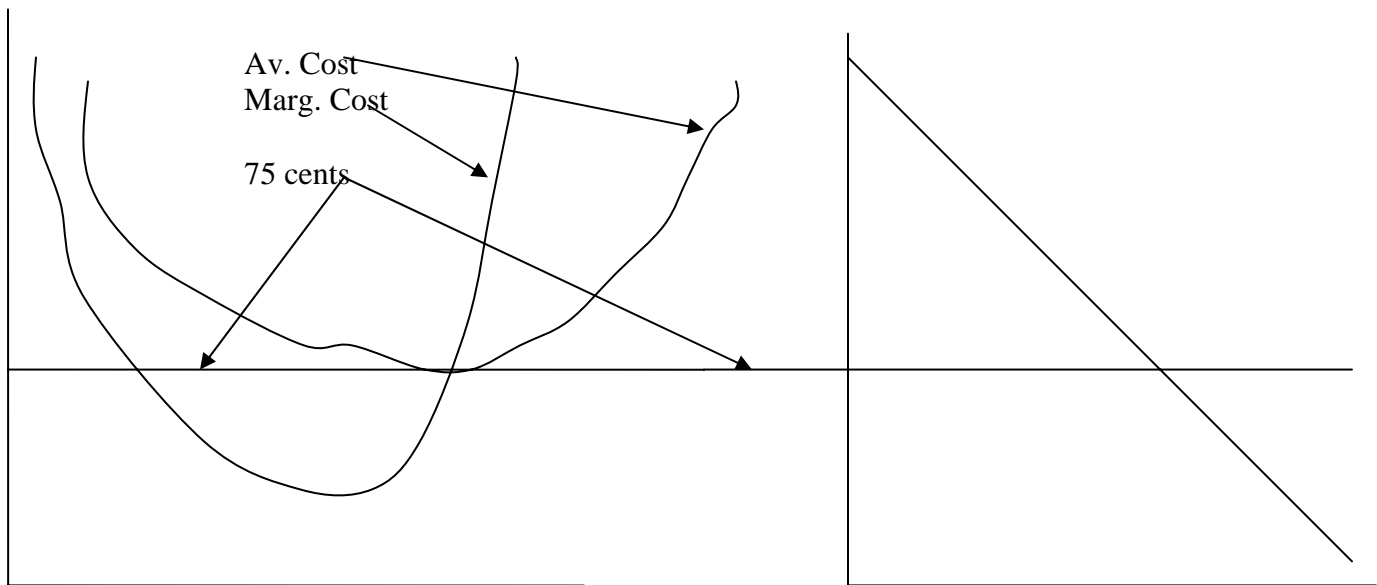
Answers

1.a) ANSWER The main answer is economies of scale. Large chains can get quantity discounts for purchasing and, presumably, quantity discounts in certain aspects of shipping. All of this leads to lower prices. In addition, a large book store can hold a wider variety of books and so consumers come to expect that it is more likely to have the book they want in stock.

1.b) ANSWER As in (a), a large internet seller has economies of scale in purchase and shipping and so it is more able to offer lower prices. Its large inventory makes it more likely to have any single book on hand for quick shipment.

1.c) ANSWER The two facts can be reconciled. The number we are trying to explain is the total number of books sold per year over the web. While people may purchase obscure books from small sellers, these books comprise only a tiny fraction of all books sold over the web. Roughly speaking, if all reindeer books are sold from [www.Finnish...](#) and all Stephen King thrillers are sold by Amazon, Amazon will end up with 98 percent of total web based book sales.

2.a) ANSWER You should be able to do this by now – I have done a sketch below with long run equilibrium where $\text{Price} = \text{Marginal Cost} = \text{Minimum Average Cost} = 75 \text{ cents}$. Two things to note about these relationships. First, $\text{Price} = \text{Marginal Cost}$ is a decision the firm manager makes in order to maximize profit. The fact that Price also equals Minimum Average Cost is not something the firm manager wants – the manager would rather make a profit than break even – but the pressure of entry forces the price that low. Second, the horizontal axis for the industry diagram represents the sum of all firms in the industry – i.e. if the firm axis is drawn in 1,000's of floppies, the industry diagram is drawn in millions of floppies.



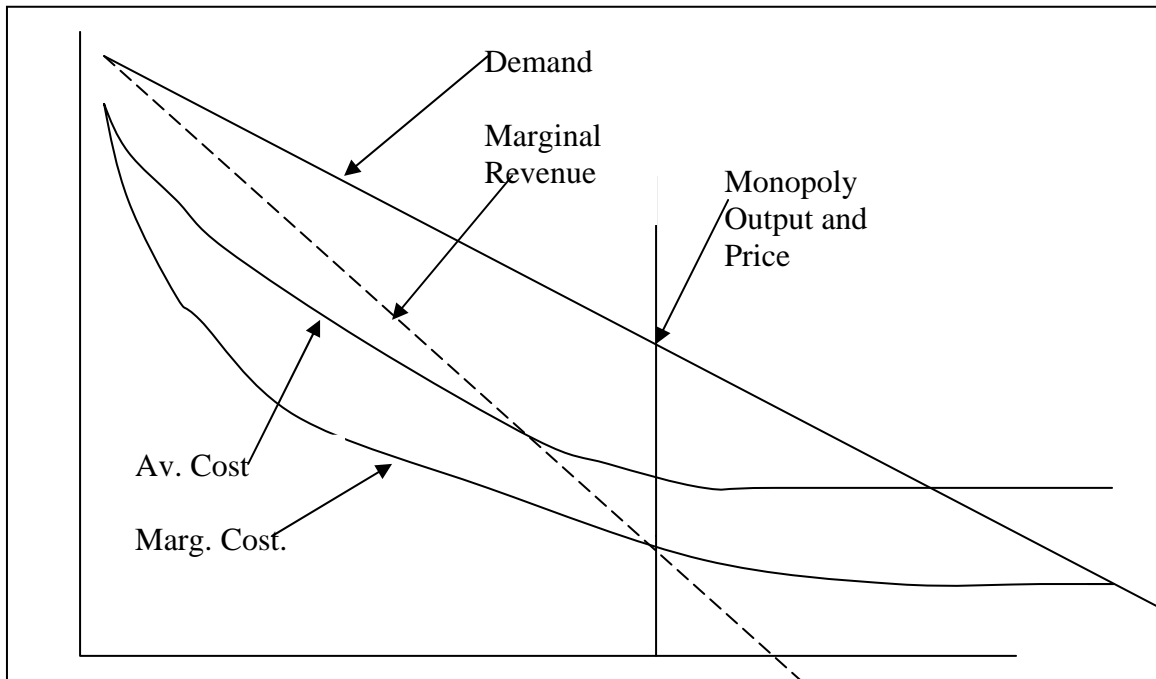
2.b) ANSWER The representative firm has no market power – i.e. no matter how much it increases or decreases its output, it cannot change the market price of \$.75 because it's output is too small a fraction of the market.

2.c) ANSWER The tax raises each firm's marginal and average cost curves by exactly \$.10 per disk at every level of Q . In the short run, the \$.75 price is no longer enough to cover minimum average cost so firms lose money and start to drop out of the industry. As firms drop out, industry supply contracts, raising the price until it reaches \$.85 per disk. At this point, the price is high enough so that firms who remain in the industry are breaking even.

At first glance, this seems like the firm has market power since the consumer ends up paying \$.10 more – i.e. all of the tax. Here, however, the price has risen because firms

have been driven out of the industry, not because an individual firm have chosen to raise their price.

3) See graph for both (a) and (b) below:



The description suggests a broad range of increasing returns to scale in which average cost continues to fall and (correspondingly) marginal cost always lies below average cost.

There is no problem running this industry as a monopoly (see graph). It is just a standard solution where marginal revenue = marginal cost, etc.

3.c) ANSWER No. If the industry begins with multiple firms and one firm, for whatever reason, gets a little larger than the others, it will experience increasing returns to scale and lower average costs which, in turn, will allow it to under price the other firms, get more business, generate still lower average costs and so on. The increasing returns to scale of the technology suggest competition can't last and the industry will tend toward a monopoly.

4.a) ANSWER The director would choose the quantity such that $MR = MC$

Since we have a straight line demand curve, $MR = 200 - 2Q$ while $MC = \$50$.

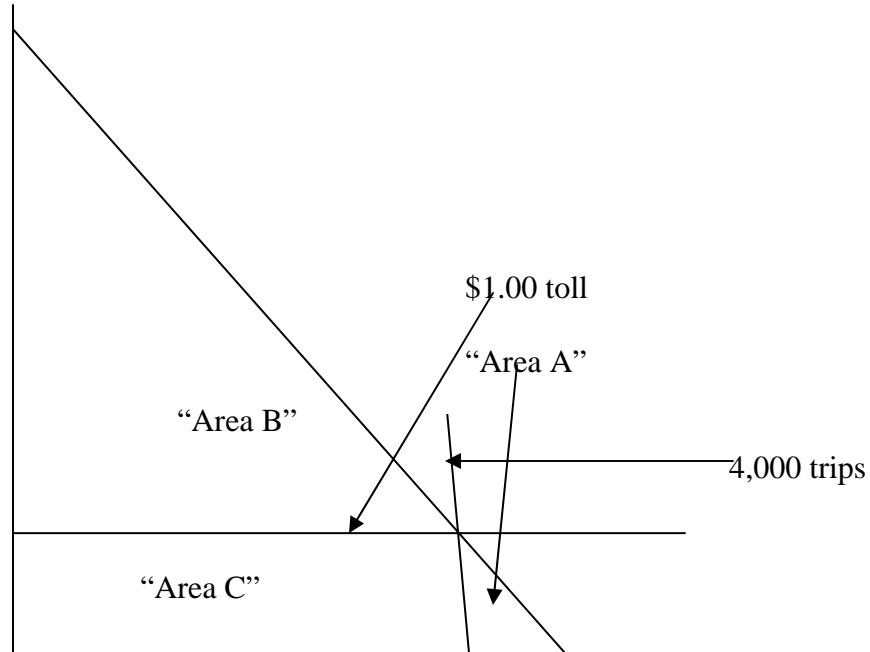
Solving, we have $\$200 - 2Q = \50 or $2Q = \$150$ or $Q = 75$ patients and so the price per patient will equal $P = \$200 - 75$ or $\$125.00$ per day.

This does leave capacity open. The reason is that filling one more bed would mean lowering the price for all persons using the center. The resulting change in revenue – Marginal Revenue – would be less than the marginal cost of $\$50.00$ per day so total profit would decrease (i.e. $MR < MC$). And adding more than one person would make the situation even worse – in other words, you have already maximized profit and filling more beds won't make profit higher.

4.b) ANSWER: Begin with the fact that Medicaid patients bring in $\$60$ per day while patients cost you $\$50$ per day. From this, you know that however many private patients you admit, you can always fill up the rest of the beds with Medicaid patients and make a profit on each one – i.e. you will end up being full.

The problem, then, is how to divide your capacity between Medicaid patients and private patients. The answer is that you will admit private patients until the marginal revenue from private patients = $\$60.00$. If you admit more private patients than that – i.e. if MR falls below $\$60.00$, you would have been better off admitting a Medicaid patient for $\$60.00$

5) ANSWER. We haven't explicitly discussed this in class but LaFourche is right when he says that the government should count both consumer surplus and toll revenue as benefits. He is also right that a toll of $\$1.00$ would still yield 4,000 trips and $\$4,000$ of revenue. He is wrong, however, that the value of $\$4,000$ revenue plus the consumer surplus at $\$1.00$ would be more than the value of the consumer surplus when the bridge is free and 5,000 trips are made. The issue is that raising the price from zero to $\$1.00$ creates deadweight loss, as shown in the following figure.



When the bridge was free, the benefit was a consumer surplus that equaled the sum of Areas A, B plus C.

Once the toll is established at \$1.00, Consumer Surplus declines from $A + B + C$ to just B. Area C moves from Consumer Surplus to represent toll revenue (which is fine from a benefit perspective) but Area A is deadweight loss - i.e. that benefit disappears because 1,000 less people are crossing the bridge.
