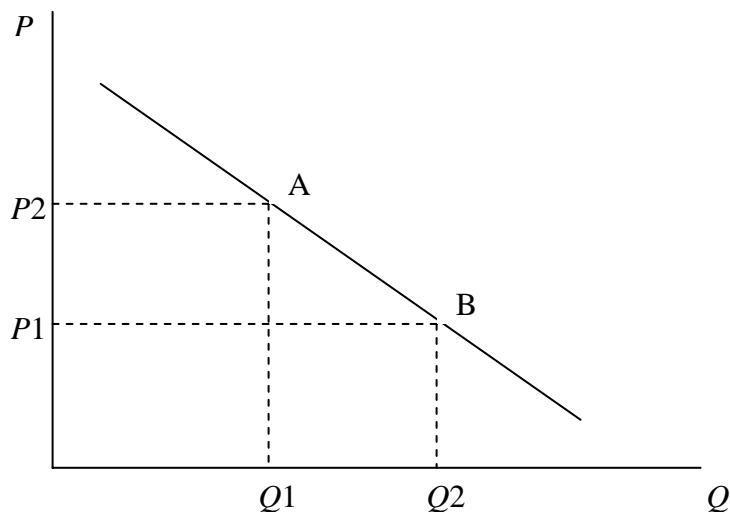


Problem Set #8
Principles of Microeconomics
Professor Hungerman

1. Suppose that the rock band The Strokes are coming to South Bend, and Ticketmaster gets to decide how much to charge for tickets. Ticket master is a monopoly and does not price discriminate.

- A. What is price discrimination? Why might Ticketmaster not price discriminate?
- B. Suppose that the *marginal revenue* function that describes demand for strokes tickets is $10 - q$ where q is the quantity of strokes tickets sold. Thus, if Ticketmaster sells 3 tickets, the additional revenue brought in by the third ticket sold is $10 - 3 = 7$. What quantity of tickets will maximize Ticketmaster's total revenue? Will Ticketmaster choose to sell this quantity? What is the price elasticity of demand at this quantity?
- C. Suppose Ticketmaster has a *marginal cost* function equal to $3q$. What quantity will Ticketmaster choose to produce?
- D. True/False: Ticketmaster will charge \$7.50 for each Strokes ticket.

2. Consider moving from point A to point B on the following demand curve.



- A. Suppose you go from point A to point B. What areas in the picture represent the revenue gained, and the revenue lost from doing so? Write down the formula that represents the change in total revenue that occurs when moving from point A to point B (your answer should be a function of P_1 , P_2 , Q_1 , and Q_2).

- B. Suppose a formula that does a good approximation for the price elasticity of demand between these two points is

$$\eta = \frac{\frac{\Delta Q}{Q1}}{\frac{\Delta P}{P1}}$$

Where $\Delta Q = Q2 - Q1$ and similarly $\Delta P = P2 - P1$ Using your formula for total revenue from part A, write down the formula for *marginal revenue*. Then, using this new formula for price elasticity of demand and some algebra, rearrange this new formula to show that

$$MR = P1 \left[1 - \frac{1}{\eta} \right]$$

- C. At what value of η does MR equal zero? At what value does MR become negative?
- D. Explain what this formula for MR says about the relationship between marginal revenue and price.
3. Suppose you were Mayor of a poor city in a developing country. Clean water is supplied by a (non price-discriminating) monopolist. People in your city are complaining that there should be more clean water in your city.
- A. Suppose water was not easily resold, and that, if allowed, the monopolist could perfectly price discriminate. What would happen to the supply of clean water if you allowed the monopolist to price discriminate?
- B. Now suppose that you could privatize clean water supply and make the provision of clean water a perfectly competitive industry. What would the supply of clean water be then?
- C. Suppose that you are up for election, and that the citizens of the town will vote for you based on how well they like the way you address the clean water shortage. If voters care about consumer surplus, which solution would be the smartest for you to support—the one outlined in part A, or in part B? What if the voters cared more about producer surplus?

Extra Credit:

Prove, without using calculus, that if an industry goes from being perfectly competitive to a (non price discriminating) monopoly, that producer surplus rises. A compelling answer will likely involve some algebraic work. I will add 3 points to your midterm score if you can come up with a convincing proof. A somewhat-convincing proof may be worth a point or two (but don't waste my time).