Microeconomic Analysis - Problem Set #7 (UNGRADED) Solutions

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1. Compare and contrast the features of (i) perfect competition, (ii) monopoly, (iii) oligopoly, and (iv) monopolistic competition. Rank each market structure (from smallest to largest) in terms of (i) the number of firms; (ii) long-run market price; (iii) equilibrium output; (iv) consumer surplus; (v) long-run profits (vi) deadweight loss.

2. Indicate based on the given information whether an industry is likely perfectly competitive, monopolistically competitive, an oligopoly, or a monopoly:

    1. Fairfax, Virginia has three movie theaters
    2. Restaurants in the greater Piedmont area, with many different cuisines to choose from
    3. All of Connecticut gets its electricity from Connecticut Light & Power company
    4. Laptops, where you can choose from many different brands (Acer, Asus, Gateway, Toshiba, Sony, HP, Dell, IBM, Lenovo, etc) and each is slightly different
    5. Wheat in the U.S., provided by many small farmers, with each farmer's wheat being identical to every other farmer's wheat
    6. The music industry, where Universal, Sony, EMI, and Warner account for 87% of the market

3. Indicate which good is more likely to have a higher markup for firms with market power in these industries, and why:

    1. Alcohol or jewelry
    2. Prescription drugs or televisions
    3. Gym memberships or school supplies
    4. Doughnuts or bread
    5. Popcorn in a movie theater or popcorn from a street vendor

4. Identify the likely source(s) of monopoly/market power for each firm or industry below:
   (a) Wireless carriers (like AT&T and Verizon)
   (b) The Broadway play *Hamilton*
   (c) DeBeers Diamonds
   (d) QWERTY keyboard layout
   (e) Pfizer's drug for neurological disorders, Lyrica
   (f) U.S. Postal Service
   (g) Cable TV
   (h) Top 40 Single Songs

5. Suppose you are a restaurant in a monopolistically competitive industry. Your firm has a constant marginal and average cost at $4 per unit.

Restaurant
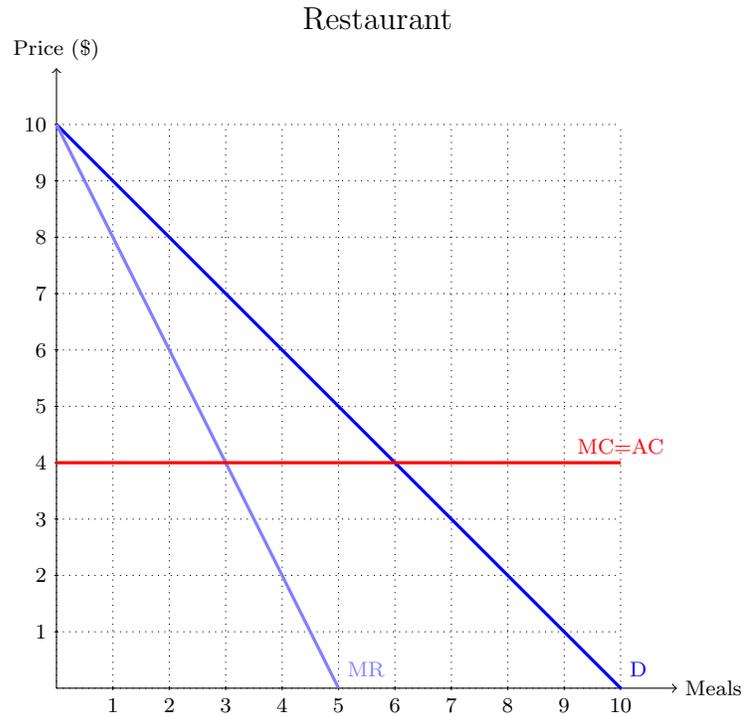
(a) If this were a perfectly competitive market, what would be the market price and equilibrium quantity?

(b) Calculate the (i) consumer surplus, (ii) producer surplus, and (iii) deadweight loss at this price and quantity. Show these on the graph.

(c) Now suppose this firm has market power from a barrier to entry, and can operate like a monopolist. What price and quantity does it set?

(d) Calculate the (i) consumer surplus, (ii) producer surplus, and (iii) deadweight loss at this price and quantity. Show these on the graph.

(e) Now suppose that the firm had earned this market power via rent-seeking. From its lobbying efforts, it had convinced the local government to require all new restaurants to get a special license, making it harder for new entrants to compete in the market. What was the most that this firm was willing to spend on lobbying in order to get the license requirement?

(f) If there are 10 identical (in terms of costs and size, if not food or brand) restaurants in the industry, and all engage in maximal rent-seeking to obtain the license, what is the true total cost of market power in this market to society?

6. You are a producer of smartphones and have some market power. You have a total cost function:

$$C(q) = 10q^2 + 200q + 1000$$

and a marginal cost function:

$$MC(q) = 20q + 200$$

You estimate the demand for your smartphones to be:

$$q = 100 - 0.2p$$

where q is millions of smartphones.

(a) Find the function your marginal revenues.

(b) How many smartphones should you produce to maximize your profit?

(c) What price should you charge to maximize your profit?

(d) What is the cost per smartphone at the quantity you are producing?

(e) What is your total profit?

(f) What would be the lowest possible price you would need to charge to break even?

(g) Below what price would your firm need to shut down in the short-run?

(h) Based on your profit-maximizing price and quantity (from parts b and c), how big is your markup of price over marginal cost? Using this, also calculate the elasticity of demand at your profit-maximizing price. Hint: the Lerner index formulation is most helpful.

7. Suppose that the demand for bentonite is given by

$$q = 40 - 0.5p$$

where q tons of bentonite per day and p is the price per ton. Bentonite is produced by a monopolist at a constant marginal and average total cost of $10 per ton.

(a) Derive the inverse demand and marginal revenue curves faced by the monopolist.

(b) Find the profit-maximizing level of output and price.

(c) How much profit does the monopolist earn?

(d) Based on the profit-maximizing price and quantity (from parts a and b), how big is the markup of price over marginal cost? Using this, also calculate the elasticity of demand at the profit-maximizing price. Hint: the Lerner index formulation is most helpful.