MONOPOLY vs. PERFECT COMPETITION: A BRIEF REVIEW

Perfect Competition is defined by:
1. Many buyers and sellers
2. Homogeneous product
3. Free entry and exit into the market for firms
4. Everyone has the same technology and consumers have perfect information

By contrast, a Monopoly occurs when there is:
1. Only one seller in the market
2. Differentiated product with no close substitutes
3. Natural or created barriers to entry
4. Possibly exclusive technology or limited flow of information to consumers

QUESTIONS & PROBLEMS

1. What’s the difference between the demand curve for a monopolist’s good and the demand curve for an individual firm’s good in perfect competition? What does this mean in terms of pricing power?

2. A “classic” monopoly problem: A monopoly faces a market demand curve given by P=42-Q. Its marginal cost curve is given by MC=Q.
   a. What is the equation for the marginal revenue? Show this on a graph.
   b. Find the profit-maximizing level of production for this monopolist.
   c. What price will the monopolist charge?
   d. What price would be socially optimal?
   e. What’s this monopolist’s total revenue?
   f. Graph the producer surplus, the consumer surplus, and the deadweight loss for the market with the monopolist.

3. T/F: A monopolist can always make a positive profit.

4. Natural monopolies occur when total costs are higher if there are multiple firms in the market, rather than just one. This typically occurs when an industry experiences economies of scale, which means that average costs are lower at high levels of production rather than low ones.
Another common feature of natural monopolies is **high barriers to entry**, meaning that it is very costly for new firms to enter.

Suppose a local utility company has a demand curve given by \( P = 120 - 4Q \), TC for firms in this industry is given by \( 400 + 4Q \), and MC is fixed at $4 per unit.

a. What is the average total cost for a firm in this industry? Does this equation indicate economies of scale?

b. What is the fixed cost? Might this indicate high barriers to entry?

c. What is the socially optimal level of production and price?

d. At the social optimum found in part b, is the “perfect competition” long run equilibrium possible? Why or why not? (Hint: In perfect competition, the price equals the marginal cost. Will this price ever cover average total cost over the range of quantities we’re interested in?)

e. Suppose this industry operates as a monopoly. Find the equilibrium price and quantity.

f. The government, bowing to public pressure to regulate monopolies, decides to force firms to charge their marginal cost just like they would in perfect competition. How much will the monopolist produce? What is their TR? What is their TC? Profits?

g. Suppose the government instead chooses to force the monopolist to charge a price equal to their average total cost. How much will the firm produce, assuming it produces more than its unregulated equilibrium? What will be their profits? (Note: This problem involves a quadratic equation. The numbers are chosen to work out nicely, but it may be difficult to do by hand, so feel free to use a calculator, just this once.)

5. Two monopolies have the same cost structure, but one faces a steeper market demand curve. (Both demand curves have the same y-intercept.) Which will charge the higher price?
1. In perfect competition, the demand curve faced by each firm is perfectly elastic. This means they have no pricing power—they face the same market price regardless of the quantity they produce, and can't do anything to change it. A monopolist, however, faces the market demand curve. By changing the quantity produced, the monopolist has the power to change the price for the entire market.

2. “Classic” Monopoly Problem:
   a. Double the slope of the demand curve to get the MR: MR=42-2Q. Graph should show a line twice as steep as the original demand curve, but with the same intercept. Note: the “double the slope” rule only works when the equation is solved for P!
   b. Set MR=MC to get 42-2Q=Q. \( Q=14 \).
   c. Plug the Q from part b into the demand curve: \( P=42-14=28 \).
   d. Socially optimal price where MC=P. \( 42-Q=Q \rightarrow Q=21 \) \( P=42-21=21 \).
   e. TR=PQ=28x14=392
   f. See Graph:

3. False. If the ATC curve lies above the demand curve, then at no price will the monopolist be able to attain a profit.
4. Natural Monopolies
   a. $\text{ATC} = \text{TC}/Q = 400/Q + 4$. Yes, this exhibits economies of scale, since ATC decreases in Q over the range of Q’s for which there is demand. (In fact, it decreases in Q forever! This is an idealization or an approximation. Most ATC curves will eventually curve back up.)
   b. FC = $400$. Yes, there are high barriers to entry. This is much higher than the price at any level of production.
   c. Social optimum where $P = MC \Rightarrow 4 = 120 - 4Q \Rightarrow Q = 29, P = $4
   d. No: The $\text{ATC} = 400/Q + 4 \geq 4 = \text{MC}$ for the range of Q that we have demand for. Thus there is no “break-even point” where ATC = MC like in perfect competition.
   e. $\text{MR} = 120 - 8Q \Rightarrow 120 - 8Q = 4 \Rightarrow Q = 14.5 \Rightarrow P = 120 - 4(14.5) = $62
   f. The monopolist will produce at the social optimum quantity of 29 units. $\text{TC} = 400 + 4(29) = $516, \text{TR} = (4)(29) = $116, \text{Profit} = -$400 \Rightarrow \text{Government subsidy will be required to keep this firm in business.}
   g. Set average total cost equal to the demand price: $120 - 4Q = 400/Q + 4 \Rightarrow Q = 25$. The firm will earn zero profit.

5. In general, the steeper the demand curve, the higher the price the firm can charge. Intuitively, this is because the percent change in quantity per 1% change in price is lower for a steeper curve.