

IFEEK特別演習IIA: 2018年度

Problem Set 4: Monopoly

- Q1. State at least THREE conditions for pure monopoly. How are they different from those for perfect competition?
- Q2. Suppose that the demand of good X is given by $X = 12 - P$ and that production cost is zero.
- Draw the marginal revenue curve and the average revenue curve.
 - How are they related, given that the demand function is linear?
 - Calculate the level of output that maximizes profit.
 - Calculate the monopoly price.
 - Calculate the monopoly profit.

Q3. The inverse demand function is $P = p(X)$ where X denotes the quantity of good X .

- Write the total revenue in terms of X . Show that the marginal revenue is given by

$$MR = P \left(1 - \frac{1}{\eta} \right), \quad \eta \equiv -\frac{P}{X} \frac{dX}{dP}$$

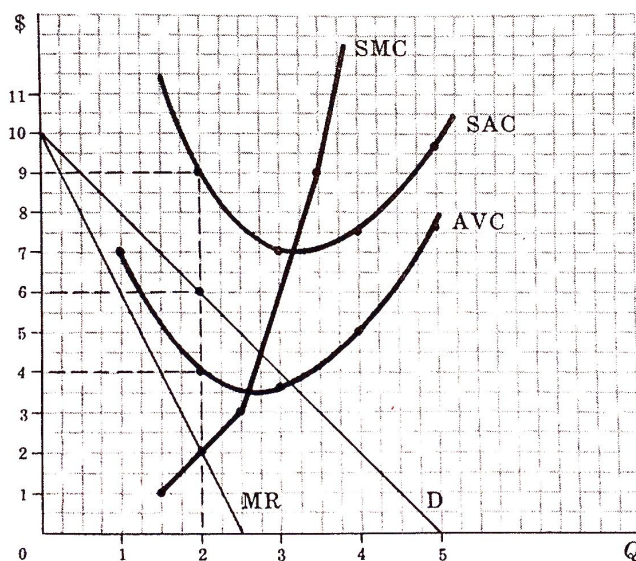
where η is equivalent to the absolute value of the price elasticity of demand.

- Consider a monopoly firm with the total cost $C(X)$. Show that the profit maximizing price is given by

$$P = \frac{MC}{1 - \frac{1}{\eta}}$$

- If the industry were perfectly competitive, what would be the value of η and the price? (Hint: use the answer to (b) and consider what happens to η under perfect competition)

Figure 1:



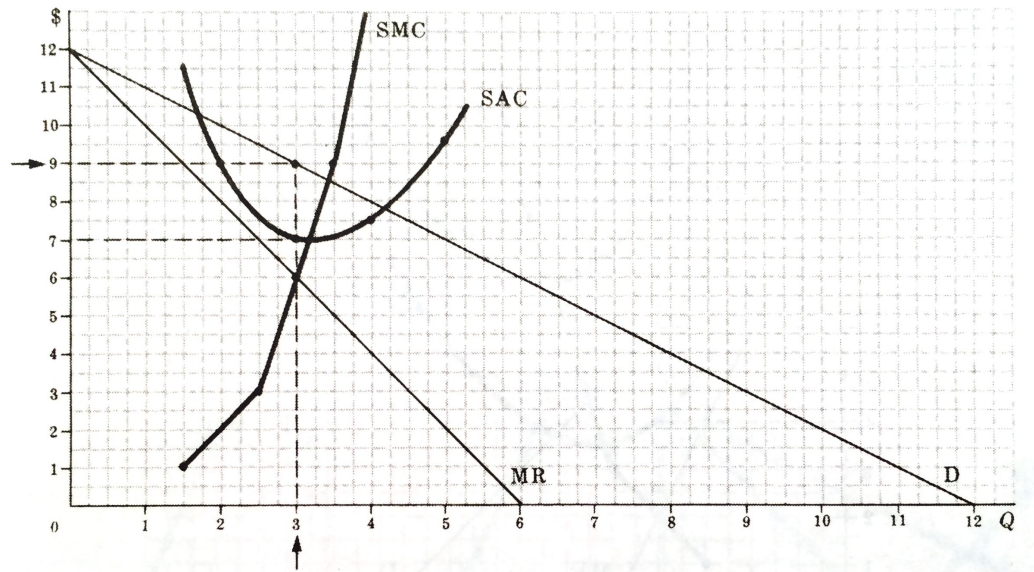
Q4. In Figure 1, SAC stands for the short-run average cost, AVC for the short-run average variable cost, SMC for the short-run marginal cost, and Q is output.

- Identify the profit-maximizing combination of price and output.
- Does the firm make positive profit?
- Does the firm shut down its production?

Q5. Explain why monopoly creates welfare loss.

Q6. Consider a monopoly firm described in Figure 2 where SAC stands for the short-run average cost, SMC for the short-run marginal cost, and Q is output.

Figure 2:



- What maximum price should the government impose on the monopoly firm to induce it to produce the competitive industry output level? [price control]
 - Consider the same monopoly but without the price control. What lump-sum tax should the government impose on the monopolist in order to eliminate all of the monopolist's profits? Identify it in the figure.
 - Does the policy in (b) affects the monopoly price? Draw a diagram which illustrates the situation after the lump-sum tax regulation is used?
- Q7. Suppose that the inverse demand function is $P = p(X)$. The total cost is $C(X) + F$. The government imposes a lump-sum tax T and a per-unit tax τ . The monopoly profit is given by $\pi = [p(X) - \tau]X - C(X) - F - T$.
- Derive the first-order condition for profit maximization.
 - Is the monopoly price affected by the lump-sum tax?
 - Is the monopoly price affected by the per-unit tax?