

Homework 5

No need to submit

Choose the best answer

1. All monopolies exist because of
 - a. firms' desire to maximize profits.
 - b. failure of antitrust laws.
 - c. barriers to entry.
 - d. natural selection.
2. For the practice of price discrimination to be successful, the monopoly must
 - a. be able to prevent resale of its product.
 - b. face similar demand curves for various markets.
 - c. have similar costs among markets.
 - d. have a downward sloping marginal cost curve.
3. The "deadweight loss" from a monopoly refers to
 - a. the portion of a monopolist's profits that are above the competitive profit level.
 - b. the increase in price due to the monopolization of a market.
 - c. the inefficient use of factors of production by a monopoly.
 - d. the loss of welfare due to the monopolization of a market that is not transferred to another economic actor.
4. Relative to uniform price policy, third degree price discrimination
 - a. always reduces welfare.
 - b. always increases welfare.
 - c. may increase welfare if total output falls.
 - d. may increase welfare if total output rises.

Analytical questions

1. Rock Oil Company is the only gasoline seller on an island. It has a constant marginal cost of production as $MC(q) = 2$. The demand for gas of all residents on the island is

$$Q_D(p) = 80 - 4p.$$

You don't need to consider fixed cost in this question.

- a. Rock Oil Company maximizes its profit as a monopoly. How many oil will it supplies to the island? What price will it charge?
- b. Calculate how much profit Rock Oil company earned in (a), illustrate it on a graph.
- c. If the government imposes a per-unit tax of $t = 2$. Compute the new equilibrium price and deadweight loss.
- d. Now consider that the government directly regulates price, what price should the government set to maximize the welfare? What will be consumer surplus and the producer surplus of Rock Oil Company?

e. Due to the change of regulation, there is another seller, Stone oil company, enters into the gasoline market of the island. It also has a marginal cost of $MC = 2$. Suppose Rock oil and Stone oil sell exactly same product, and they do not collude. What do you think is the equilibrium price?

f. Consider the same situation in (e), but now Rock Oil and Stone Oil decide to collude. What will the equilibrium price be?

2. Price Discrimination Consider a theme park in setting price of its ticket. Denote q as the number of facilities a representative consumer used in the theme park. The demand (marginal utility) of the consumer can be approximate by

$$p_D(q) = 105 - 5q.$$

The theme park has a constant marginal cost of \$5 of operating each facility usage. (The theme park does not have a fixed cost)

a. If the theme park does not charge admission fee, but charge the same fee for using each facility. Denote this per facility price as p , compute the optimal monopoly price and the theme park's profit.

b. Suppose now the theme park learns the demand curve of the consumer, so it can exercise first-degree price discrimination. Describe the theme park's pricing strategy and compute (approximately) the profit.

c. Because charging each unit for different price is hard to implement, the theme park decides to use "two-part tariff". It sets up an admission fee T and then charges each use of facility a price p . Show that by setting T and p properly, the theme park can reach the same profit as in part (b).

3. HK Airline company is operating a flight from city A to city B. The consumer can be categorized into two groups: business travelers and leisure travelers. Business traveler's demand is

$$D^B(p) = 1000 - p;$$

and the leisure traveler's demand is

$$D^L(p) = 500 - p.$$

The marginal cost of handling each passenger is constant at \$50.

a. If the Airline company cannot distinguish between two travelers, therefore cannot charge different price. (No price discrimination) What price shall it charge to maximize profit?

[Hint: you need to compute the market demand first. Use a diagram to help you]

b. The Airline Company hires a group of data scientists and now can identify these two group of travelers by big data techniques. So it can charge p_B to business travelers and p_L to leisure travelers. Solve for p_B and p_L that maximizes profit. How much more profit it earns compare to part (a).

c. Compare consumer surpluses of part (a) and part (b), for both groups of consumers.

4. Textbook exercise 14.1
5. Textbook exercise 14.3
6. Textbook exercise 14.6