

5 Oligopolistic Competition

Practice Question 12 (Stackelberg Equilibrium). Duopoly quantity-setting firms face inverse market demand of

$$p = 175 - q_1 - q_2$$

Each firm has a marginal cost of \$70 per unit. Firm 2 has a fixed cost of entry of \$100. Suppose firm 1 moves first.

- (a) What is the Stackelberg equilibrium output for each firm and what is the equilibrium price?
- (b) What is the minimum quantity that firm 1 would have to produce to deter firm 2 from entering the market?
- (c) What is the optimal strategy for firm 1? That is, should firm 1 produce the amount that deters entry, or Stackelberg leader output?

Practice Question 13 (Bertrand Equilibrium). Consider the following Bertrand game where firms 1 and 2 have the following demands:

$$q_1 = 14 - p_1 + \frac{1}{4}p_2$$

$$q_2 = 14 - p_2 + \frac{1}{4}p_1$$

where q_1 and q_2 represents pizzas sold per hour at each firm. For simplicity, suppose that all costs are fixed at $F_1 = F_2 = 20$ per hour.

- (a) Briefly explain why the two firms' pizzas are substitutes for each other.
- (b) What are the Nash equilibrium prices of pizzas? How much profit does each firm make per hour? Show your work.
- (c) Draw a diagram of the two firms' best-response functions. Using the best response functions, explain why firm 1 would NOT set a price of \$6 per pizza in equilibrium.

Practice Question 14 (Monopolistic Competition). An incumbent firm, Firm 1, faces a potential entrant, Firm 2, with a lower marginal cost. The market demand curve is

$$p = 120 - q_1 - q_2$$

Firm 1 has a constant marginal cost of \$20, while Firm 2's is \$10.

- (a) What are the Nash-Cournot equilibrium price, quantities, and profits if the government does not intervene?
- (b) To block entry, the incumbent appeals to the government to require that the entrant incur extra costs. What happens to the Nash-Cournot equilibrium if the legal requirement causes the marginal cost of the second firm to rise to that of the first firm, \$20?
- (c) Now suppose that the barrier leaves the marginal cost alone but imposes a fixed cost. What is the minimal fixed cost that will prevent entry?