

- ① Suppose the demand curve is $Q(p) = p^\epsilon$, what is the elasticity of demand? If marginal cost is \$1 and $\epsilon = -2$, what is the profit-maximizing price?

elasticity

$$Q(p) = p^\epsilon$$

$$FOC: \frac{dQ}{dp} = \epsilon p^{\epsilon-1}$$

$$\frac{dQ}{dp} \cdot \frac{p}{Q} = \epsilon p^{\epsilon-1} \cdot \frac{p}{p^\epsilon}$$

$$\frac{dQ}{dp} \cdot \frac{p}{Q} = \epsilon p^{\epsilon-1} \cdot p^{\epsilon-1}$$

$$\frac{dQ}{dp} \cdot \frac{p}{Q} = \epsilon \neq$$

$\therefore$ elasticity is equal to ϵ

Profit maximizing price

$$Q(p) = p^\epsilon$$

$$p = Q^{1/\epsilon}$$

$$TR = Q \cdot Q^{1/\epsilon}$$

$$= Q^{1/\epsilon+1}$$

$$MR = (1/\epsilon+1) Q^{1/\epsilon}, MC = 1$$

$$MR = MC$$

$$(1/\epsilon+1) Q^{1/\epsilon} = 1$$

$$Q^{1/\epsilon} = \frac{1}{1/\epsilon+1}, \epsilon = -2$$

$$Q^{-1/2} = 2$$

$$Q = \frac{1}{4} \rightarrow p = \frac{1}{4}^{-1/2} = 2$$

- ② Suppose the demand curve for corn is $Q(p) = 10 - p$. Suppose that one firm owns all five units of corn in the world and has zero marginal cost. Does a monopoly sell less output than would be sold in a competitive market in which 100 firms each own 0.05 units?

$$Q = 10 - p$$

$$p = 10 - Q$$

$$TR = p \cdot Q, MC = 0$$

$$TR = 10Q - Q^2, MR = 10 - 2Q$$

Profit max condition : $MR = MC$

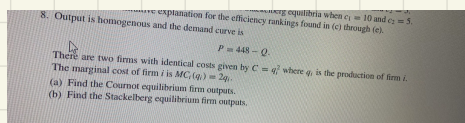
$$10Q - Q^2 = 0$$

$$10 - 2Q = 0$$

$$Q = 5$$

total output sold by competitive firms = $100 \times 0.05 = 5$

$\therefore$ monopoly sell same amount of output as competitive market



$$(a) Q = (Q_1 + Q_2) \rightarrow P = 448 - (Q_1 + Q_2)$$

$$TR_1 = (448 - Q_1 - Q_2) Q_1 \quad TR_2 = (448 - Q_1 - Q_2) Q_2$$

$$= 448Q_1 - Q_1^2 - Q_1Q_2 \quad = 448Q_2 - Q_1Q_2 - Q_2^2$$

$$FOC: MR_1 = \frac{dTR_1}{dQ_1} = 448 - 2Q_1 - Q_2 \quad MR_2 = \frac{dTR_2}{dQ_2} = 448 - Q_1 - 2Q_2$$

$$MR_1 = MC_1$$

$$MR_2 = MC_2$$

$$448 - 2Q_1 - Q_2 = 2Q_1$$

$$448 - Q_1 - 2Q_2 = 2Q_2$$

$$448 - 4Q_1 = Q_2$$

$$448 - 4Q_2 = Q_1$$

$$Q_1 = \frac{448 - Q_2}{4}$$

$$Q_2 = 112 - \frac{1}{4}Q_1$$

$$= 112 - \frac{1}{4}Q_2$$

firm 1 & firm 2 reaction are simultaneously

$$Q_1 = 112 - \frac{1}{4}(112 - \frac{1}{4}Q_1)$$

$$= 112 - 28 + \frac{1}{16}Q_1$$

$$= 84 + \frac{1}{16}Q_1$$

$$\frac{15}{16}Q_1 = 84$$

$$Q_1 = 84 \left(\frac{16}{15}\right)$$

$$Q_1 = 89.6 \neq$$

$$Q_2 = 89.6 \neq$$

(b) assume that firm 1 is the stackberg

$$Q_1 = 112 - \frac{1}{4}Q_2$$

$$P = 448 - (112 - \frac{1}{4}Q_2) - Q_2$$

$$= 336 - \frac{3}{4}Q_2$$

$$TR_2 = P \cdot Q_2 = (336 - \frac{3}{4}Q_2) Q_2$$

$$= 336Q_2 - \frac{3}{4}Q_2^2$$

$$MR_2 = 336 - \frac{6}{4}Q_2$$

$$MR_2 = MC_2$$

$$336 - \frac{6}{4}Q_2 = 2Q_2$$

$$336 = \frac{14}{4}Q_2$$

$$Q_2 = 0.0104 \neq$$

$$Q_1 = 112 - \frac{1}{4}(0.0104)$$

$$Q_1 = 111.99 \neq$$

4 (write about 0.5 page) Find 1 example of an industry that has a dominant firm. Describe what this industry is, which firm is the dominant firm, which firms are fringe firms (name the ones that you

In United States, Microsoft, which is in the application software and personal computer market, maintains its monopoly in the desktop operating system market. Vast majority of PCs use windows as a operating system. According to Statcounter, windows account for 75.28% while other fringe firms such as os x, chrome ox, linux account for less than 20%. At early day when windows was introduced in the market, it was not a monopoly firm. However, in 1980s Microsoft become leaders of the new computer industry. This might be the fact that Microsoft entry the market quite earlier than other so it can grow faster than other companies. Even though company like Apple has technological more innovative than windows

Desktop Operating System Market Share Worldwide July 2021 - July 2022

