

homework # 1

1) $Q(p) = p^E$

$$\frac{dQ}{dp} = E p^{E-1}$$

$$\frac{dQ}{dp} \times \frac{p}{Q} = E p^{E-1} \left(\frac{p}{p^E} \right)$$

$$= E p^{E-1} \times p^{1-E}$$

$$= E \text{ (elasticity)}$$

$$TR = Q^{\frac{1}{E} + 1}$$

$$MR = \left(\frac{1}{E} + 1 \right) Q^{\frac{1}{E}}$$

$$E = -2$$

$$MC = MR \quad ; \quad 1 = \left(\frac{1}{E} + 1 \right) Q^{\frac{1}{E}}$$

$$Q^{\frac{1}{E}} = \frac{1}{\frac{1}{E} + 1}$$

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

$$Q^{-\frac{1}{2}} = 2$$

$$Q = \frac{1}{4}$$

$$\left(\frac{dQ}{dp} \right) \left(\frac{p}{Q} \right) = E \left(\frac{Q^{\frac{1}{E}}}{Q} \right)$$

$$= -2 \cdot \frac{2}{\frac{1}{4}}$$

$$= -16$$

2) $Q = 10 - P$ max profit $MR = MC$
 $P = 10 - Q$ $10 - 2Q = 0$
 $Q = 5$

total output sold by competitive firm = (output sold by each firm $\times$ number of firm) = $(0.05)(100) = 5$

No, Monopoly sells the same quantity in competitive market

8. Output is homogenous and the demand curve is

$$P = 448 - Q$$

There are two firms with identical costs given by $C = q_i^2$ where q_i is the production of firm i . The marginal cost of firm i is $MC_i(q_i) = 2q_i$.

- (a) Find the Cournot equilibrium firm outputs.
 (b) Find the Stackelberg equilibrium firm outputs.

3) Cournot

$$P = 448 - Q$$

$$Q = 448 - P$$

$$\pi = PQ - Q^2$$

$$= (448 - Q_1^P - Q_2^P) Q_1^P - Q_1^2$$

$$= 448 Q_1^P - Q_1^2 - Q_1^P Q_2^P - Q_1^2$$

$$= 448 Q_1^P - Q_1^P Q_2^P - 2Q_1^2$$

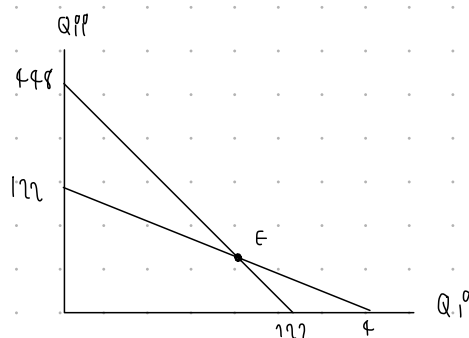
$$\frac{d\pi}{dQ_1^P} = 448 - Q_2^P - 4Q_1^P$$

$$448 - Q_2^P - 4Q_1^P = 0$$

$$4Q_1^P = 448 - Q_2^P$$

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

$$Q_2^P = 448 - 4Q_1^P$$



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

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

$$Q_1^P = 112 - \frac{1}{4} Q_1^P$$

$$Q_1^P = 112 - \frac{1}{4} Q_1^P + \frac{1}{16} Q_1^P$$

$$\frac{15}{16} Q_1^P = 91.5$$

$$Q_1^P = 97.6$$

$$Q_2^P = 97.6$$

Stackelberg

Firm 1 = leader

$$Q_1 = 112 - 0.25 Q_2$$

$$P = 448 - (112 - 0.25 Q_2) - Q_2$$

$$P = 448 - 112 + 0.25 Q_2 - Q_2$$

$$= 336 - 0.75 Q_2$$

profit max

$$MR = MC$$

$$336 - 1.5 Q_2 = 2Q_2$$

$$3.5 Q_2 = 336$$

$$Q_2 = 96$$

Firm 2 = follower

$$TR_2 = (P)(Q_2)$$

$$TR_2 = (336 - 0.75 Q_2) \cdot Q_2$$

$$= 336 Q_2 - 0.75 Q_2^2$$

$$MR_2 = 336 - 1.5 Q_2$$

$$Q_1 = 112 - 0.25(96)$$

$$= 88$$

4)

From what I understand in Microeconomics theory class, my example of an industry that has a dominant firm and the fringe firm would be "Charoen Pokphand" or what we have known as CP company, the largest food industry in Thailand and most of the farmers in Thailand. I think CP is the dominant in this industry and the reason is CP is the one who provide all of the seeds and breeders to the farmers that want to sell products back to them in order to control the quantity and quality of the products. All of the farmers do not have any choice but to buy the seeds and breeders from CP since they are the biggest buyer and seller agriculture products in Thailand and CP is also the price taker in the market according to the fact that all the farmers and sellers in Thailand have to adjust their price to the price that CP set in the market in order to be able to sell their products. It's most likely the same thing as there's the huge gold shop who set the market price and the rest of the shop have to set their price according to market price which setting by the dominant firm. In conclusion I think that CP company is the dominant firm in this industry and farmers in Thailand is fringe in the industry.

Nirhan Boonmee 6304640813