

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

$$\frac{dQ}{dP} = E P^{E-1}$$

$$\frac{dQ}{dP} \cdot \frac{P}{Q} = E P^{E-1} \cdot \frac{P}{P^E}$$

$$= E P^{E-1} \cdot P^{1-E}$$

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

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

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

$$E = -2$$

$$\text{find } MC = MR$$

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

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

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

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

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

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

$$\frac{dQ}{dP} \cdot \frac{P}{Q} = E \cdot \frac{Q^{\frac{1}{E}}}{Q}$$

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

$$= -16$$

$$2) Q = 10 - P \rightarrow P = 10 - Q$$

$$TR = 10Q - Q^2 \quad MR = 10 - 2Q \quad MC = 0$$

$$\text{find } MR = MC$$

$$10 - 2Q = 0$$

$$2Q = 10$$

$$Q = 5$$

$\therefore$  No monopoly sell the same amount as the competitive market

$$3) P = 488 - Q \rightarrow Q = 488 - P$$

Cournot model

$$P = P(Q)Q = C(Q)$$

$$= (488 - Q_i - Q_x) Q_i - Q_i^2$$

$$= 488 Q_i - Q_i^2 - Q_x Q_i - Q_i^2$$

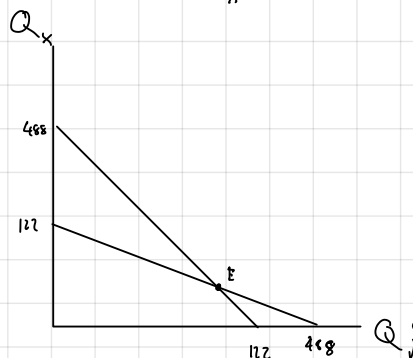
$$= 488 Q_i - Q_x Q_i - 2Q_i^2$$

$$\frac{d\pi}{dQ_i} = 488 - Q_x - 4Q_i = 0$$

$$4Q_i = 488 - Q_x$$

$$Q_i = 122 - \frac{1}{4} Q_x$$

$$Q_x = 488 - 4Q_i$$



$$\therefore Q_i = 122 - \frac{1}{4} Q_x$$

$$Q_x = 488 - 4Q_i$$

$$Q_i = 122 - \frac{1}{4} (488 - 4Q_i)$$

$$Q_i = 122 - 30.5 + \frac{1}{16} Q_i$$

$$\frac{15}{16} Q_i = 91.5$$

$$Q_i = 97.6$$

$$Q_x = 97.6$$