Wisarud 6304641860

1) $Q(p) = p^{\epsilon}$

$\frac{dQ}{dP} = \epsilon p^{\epsilon-1}$ $\quad \frac{dQ}{dP} \cdot \frac{P}{Q} = \epsilon p^{\epsilon-1} \cdot \frac{P}{p^{\epsilon}}$

$= \epsilon p^{\epsilon-1} \cdot p^{1-\epsilon}$

$= \epsilon \rightarrow$ elasticity $= \epsilon$

$TR = Q^{1/4} + 1$ $\quad MR = (\frac{1}{\epsilon} + 1) Q^{\frac{1}{4}}$

find $MC = MR$

$1 = (\frac{1}{\epsilon} + 1) Q^{1/4}$

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

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

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

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

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

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

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

$= -16$

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

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

find $MR = MC$

$10 - 2q = 0$

$2q = 10$

$q = 5$

Total output of competitive firm $= 100 \cdot 0.05$

I would say no, because monopoly sell the same amount of output in the competitive market

3) $P = 488 - Q$ $\quad Q = 488 - P$ $\quad C = Q_i^2$ $\quad MC_i(Q_i) = 2q_i$

1) cournot model

$\pi = P(Q)Q - C(q_i)$

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

$= 488 q_i - q_i^2 - Q_x q_i - q_i^2$

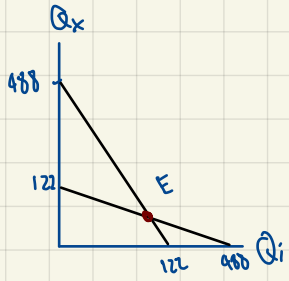
$= 488 q_i - Q_x q_i - 2q_i^2$

$\frac{d\pi}{dq_i} = 488 - Q_x - 4q_i = 0$

$4q_i = 488 - Q_x$

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

$Q_x = 488 - 4q_i$



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

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

$Q_i = 122 - \frac{1}{2}(122 - \frac{1}{4} Q_i)$

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

$Q_i = 97.6$

$Q_x = 97.6$