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

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

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

$TR = Q^{1/\epsilon + 1}$
$MR = \left(\frac{1}{\epsilon} + 1\right) Q^{1/\epsilon}$
$\epsilon = -2$
$MC = 1$

$MC = MR$
$1 = \left(\frac{1}{-2} + 1\right) Q^{1/-2}$
$Q^{1/-2} = 2 \qquad Q = \frac{1}{4}$

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

$$= -2 \cdot \frac{2}{1/4} = -16_{H}$$

2) $p = 10 - Q_1$
$TR = 10Q_1 - Q_1^2$
$MR = 10 - 2Q_1$
$MC = 0$

$MC = MR$
$10 - 2Q_1 = 0$
$Q_1 = 5$

100 firms each own 0.05 units

$Q_2 = 100 \times 0.05 = 5$

Monopoly output is equal to competitive firms combine

3) Cournot eq. $\quad P = 448 - Q_1 - Q_2$

firm$_1$
$TR = 448Q_1 - Q_1^2 - Q_1Q_2$
$MR = 448 - 2Q_1 - Q_2$
$MC = 2Q_1$

firm$_2$
$TR = 448Q_2 - Q_2^2 - Q_1Q_2$
$MR = 448 - 2Q_2 - Q_1$
$MC = 2Q_2$

π max$_1$: $MC_1 = MR_1$
$448 - 2Q_1 - Q_2 = 2Q_1$
$Q_1 = 112 - 0.25Q_2$ —— ①

π max$_2$: $MC_2 = MR_2$
$448 - 2Q_2 - Q_1 = 2Q_2$
$Q_2 = 112 - 0.25Q_1$ —— ②

sub ② → ①
$Q_1 = 112 - 0.25(112 - 0.25Q_1)$
$Q_1 = 112 - 28 + \frac{1}{16}Q_1$
$Q_1 = 84 \cdot \frac{16}{15} = 89.6$

sub Q_1 into ②
$Q_2 = 112 - 0.25(89.6)$
$Q_2 = 89.6$

$Q_1 = Q_2 = 89.6$ units

b) stackleberg eq.

$Q_1 = 112 - 0.25 Q_2$ —— ①

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

$P = 336 - 0.75Q_2$

$TR_2 = P \cdot Q_2 = 336Q_2 - 0.75Q^2$

$MR_2 = 336 - 1.5Q_2$

π max condition

$MC_2 = MR_2$

$2Q_2 = 336 - 1.5Q_2$

$3.5Q_2 = 336$

$Q_2 = 96$ units

sub Q_2 into - ①

$Q_1 = 112 - 0.25(96) = 112 - 24 = 88$ units

4) one example of an industry that have dominant firm from my opinion is footwear industry in U.S.A.

As we all know, this industry is about making shoes and involved in design, manufacturing and selling. Each firms might have their own strategies, some are focusing on fashion and design, some keep their uniqueness and some are focusing on technology and comfort.

According to companiesmarketcap.com, Nike is dominating in this industry which is six times larger than a second biggest firms (Adidas). or almost 62% in the market cap

For fringe firms; Adidas, Fila, Crocs, Under armour etc. are examples of it. These firms are holding marketcap from 1%-10%.