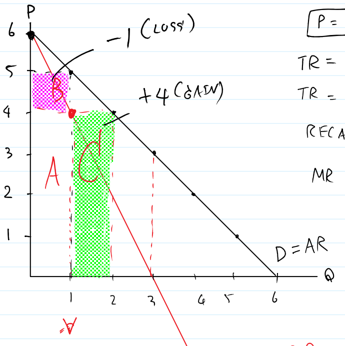
MARKET POWER: MONOPOLY

(P) PRICE	(Q) QUANTITY	(TR) TOTAL REVENUE	(MR) MARGINAL REVENUE	(AR) $= \frac{TR}{Q}$ AVERAGE REVENUE
6	0	0	–	–
5	1	5		5
4	2	8	+3	4
3	3	9	+1	3
2	4	8	−1	2
1	5	5	−3	1

−5

+3

MR WHEN Q = 1



$\boxed{P = 6 - Q}$ (INVERSE) DEMAND FUNCTION

$TR = P \cdot Q$

$TR = (6-Q)\cdot Q = 6Q - Q^2$

RECALL THAT $MR = \frac{dTR}{dQ}$

$MR = \frac{dTR}{dQ} = \frac{d(6Q-Q^2)}{dQ} = 6 - 2Q.$

PROFIT MAXIMIZATION RULE: $MR = MC$

$MR = 6 - 2Q$

A+B

(A+C) − (A+B)

= −B+C

A+C

AT $P = 5$, $Q = 1$, SO $TR = 5$

AT $P' = 4$, $Q' = 2$. SO $TR' = 8$

$\Delta TR = TR' - TR = 8 - 5 = +3$:)

Q: WHY MR INCREASES BY +3 BAHT ONLY, NOT 4 BAHT (= P')?

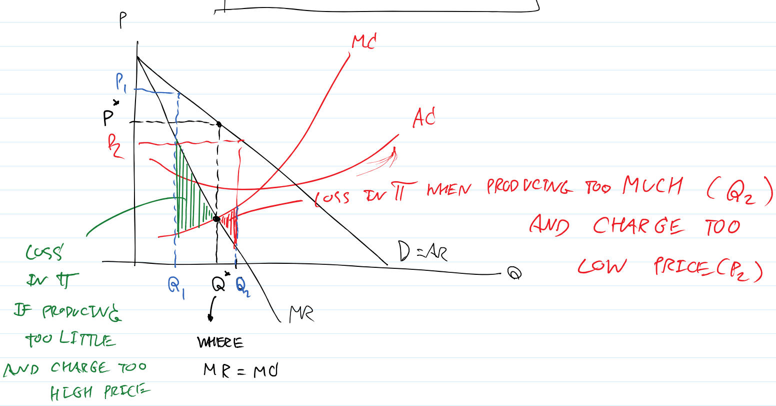
NEXT: PROFIT MAXIMIZATION:

$$\max_{Q} \pi(Q) = TR(Q) - TC(Q)$$

$$\frac{d\pi(Q)}{dQ} = \frac{dTR(Q)}{dQ} - \frac{dTC(Q)}{dQ} = 0$$

$$= MR(Q) - MC(Q) = 0$$

$$\boxed{MR(Q^*) = MC(Q^*)}$$



RULE OF THUMB FOR PRICING

AS WE DO NOT KNOW AR, MR, MC THE FIRM FACES, WE WANT TO FIND A CONVENIENT METHOD THAT HELPS A MANAGER TO SET "THE PRICE" IN WHICH COMPLIES W/ MR−MC RULE ABOVE.

INVERSE DEMAND FUNCTION, ACTUALLY.

RECALL THAT $MR = \frac{dTR(Q)}{dQ} = \frac{d[P(Q)\cdot Q]}{dQ}$

$$MR = P(Q)\cdot \underbrace{\cancel{\frac{dQ}{dQ}}}_{1} + Q\frac{dP(Q)}{dQ}$$

$$= P(Q) + Q\frac{dP(Q)}{dQ}\cdot\frac{P(Q)}{P(Q)}$$

$$= P + Q\frac{dP}{dQ}\cdot\frac{P}{P}$$

$$= P\left(1 + \frac{Q}{P}\cdot\frac{dP}{dQ}\right)$$

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

$$= P\left(1 + \frac{Q}{P}\cdot\frac{dP}{dQ}\right) \qquad \boxed{E^D = \frac{dQ}{dP}\cdot\frac{P}{Q}}$$

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

SO, THE PROFIT MAXIMIZING CONDITION CAN BE WRITTEN AS

$$\underbrace{P\left(1 + \frac{1}{E^D}\right)}_{MR} = MC$$

$$P + P\left(\frac{1}{E^D}\right) = MC$$

$$P - MC = -P\left(\frac{1}{E^D}\right)$$

$$\boxed{\frac{P - MC}{P} = -\frac{1}{E^D}}$$

IS...
THE MARKUP OVER MARGINAL COST AS A PERCENTAGE OF PRICE.

OR

$$\boxed{P = \frac{MC}{1 + \left(\frac{1}{E^d}\right)}}$$

EX1 IF $E^d = -4$, $MC = 9$ BAHT/UNIT,

THEN $P = \dfrac{9}{1 + \left(\frac{1}{-4}\right)} = 12$ BAHT/UNIT

$$\boxed{\frac{P - MC}{P} = \frac{1}{-E^d}} \iff \frac{12 - 9}{12} = \frac{1}{-4}$$

EX2 → MAKRO : $E^d = -10$, LET'S SAY. $P = \dfrac{MC}{1 + \frac{1}{-10}} \Rightarrow P = \dfrac{MC}{\frac{9}{10}} \Rightarrow P = \dfrac{10}{9}MC$

$\Rightarrow P = 1.11\,MC \Rightarrow$ P CAN BE 11% ABOVE MC.

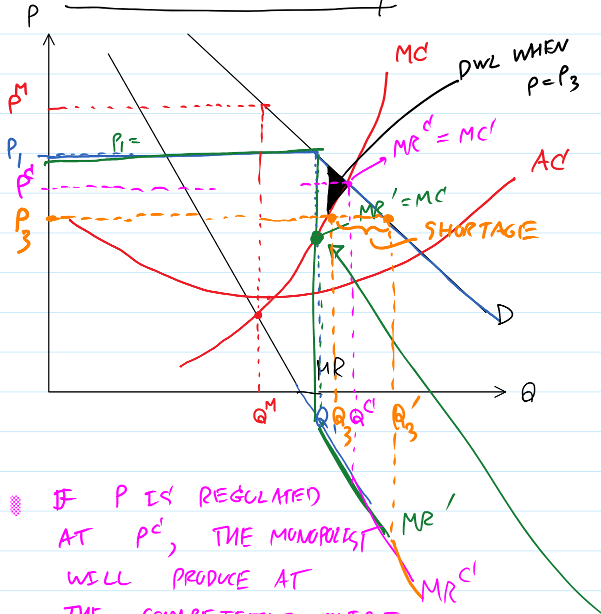
$E = -5$, LET'S SAY. $P = \dfrac{MC}{1 + \frac{1}{-5}} \Rightarrow P = \dfrac{MC}{\frac{4}{5}} \Rightarrow P = \dfrac{5}{4}MC$

$\Rightarrow P = 1.25\,MC$

P CAN BE HIGHER THAN MC BY 25%.

Wednesday, October 18, 2017 11:57 AM

REGULATING MONOPOLY



AS MONOPOLY CREATES DWL, GOVT MAY WANT TO "REGULATE" THE MONOPOLY BY PRICE REGULATION

W/ THE REGULATED PRICE AT P_1, THE DEMAND CURVE THE MONOPOLIST FACES WILL BE HORIZONTAL UNTIL $Q = Q_1$ AND FOLLOW THE ORIGINAL DEMAND CURVE AFTERWARDS

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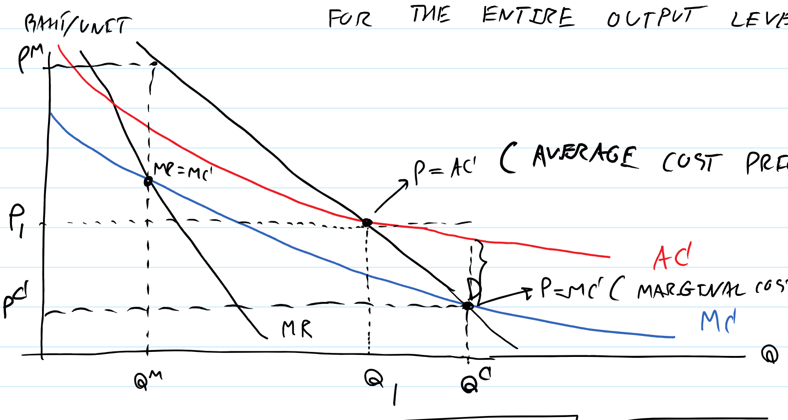
NOW, THE MONOPOLIST WILL PRODUCE AT THE QUANTITY WHERE $MR' = MC$, WHICH IS $Q = Q_1$.

- IF P IS REGULATED AT P^c, THE MONOPOLIST WILL PRODUCE AT THE COMPETITIVE OUTPUT (Q^c)

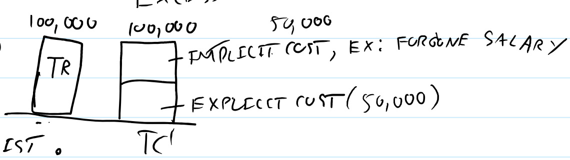
- IF P IS REGUATED AT $P = P_3$, SHORTAGE WOULD OCCUR AS $Q_3' > Q_3$ IN ADDITION TO DWL.

REGULATING NATURAL MONOPOLY

NATURAL MONOPOLY = FIRM THAT AVERAGE COST IS FALLING FOR THE ENTIRE OUTPUT LEVEL.



ECONOMIC PROFIT OR EXCESS PROFIT = 0



AT $P = P_1$, $Q = Q_1$ AND NO EXCESS PROFIT FOR THE MONOPOLIST.

AT $P = P^c$, QUANTITY DEMANDED WOULD BE Q^c BUT NO PRODUCTION AS THE MONOPOLIST WILL NOT WANT TO PRODUCE. (WHY?)

SO, ONLY W/ $P = AC$, Q_1 = THE LARGEST POSSIBLE OUTPUT THAT THE MONOPOLIST CAN STILL SUPPLY TO THE MARKET (DO NOT LEAVE THE BUSINESS)