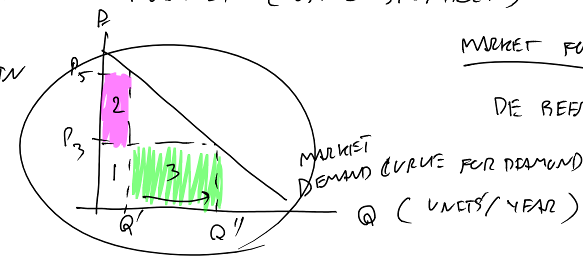
Friday, March 13, 2015 12:31 PM

MONOPOLY

- A SINGLE SELLER OR A GROUP OF SELLERS PRODUCES AND SELLS GOOD W/ NO CLOSE SUBSTITUTES
- MONOPOLIST IS A PRICE MAKER OR PRICE SETTER:
  THE MONOPOLIST CAN SET EITHER (PRICE TO CHARGE) OR = (OUTPUT LEVEL TO PRODUCE AND SEL) HE WANT
- MONOPOLIST FACES W/ AN ENTIRE MARKET DEMAND CURVE: HE CAPTURE THE WHOLE MARKET (OR CUSTOMERS)

VOLUME - MARGIN TRADEOFF



MARKET FOR DIAMOND

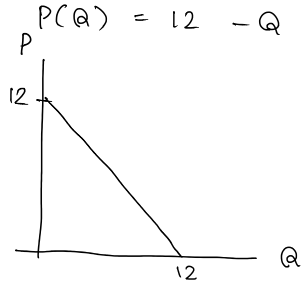
DE BEER IS A MONOPOLIST.

- A PROFIT MAXIMIZING OUTPUT OCCURS WHERE MARGINAL REVENUE (MR) = MARGINAL COST (MC)

NOTE IN PC MARKET, P = MR
IN MONOPOLY, MR < P (WHY?)
D-I-Y

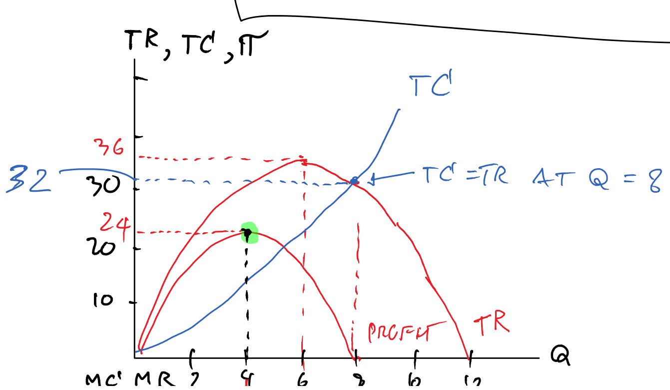
LET'S BEGIN . . .

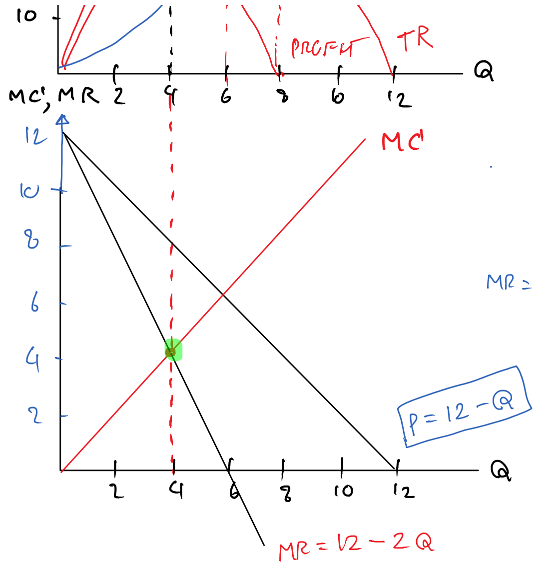
$P(Q) = 12 - Q$



$TC(Q) = \frac{1}{2}Q^2$.

Q	P	TR	MR	AR	TC	π = TR − TC
0	12	0			0.00	0
1	11	11			0.50	10.5
2	10	20			2.00	18
3	9	27			4.50	22.5
4	8	32			8.00	24
5	7	35			12.50	22.50
6	6	36			18.00	18
7	5	35			24.50	10.50
8	4	32			32.00	0
9	3	27			40.50	−13.5
10	2	20			50.00	−30.0





$P = 12 - Q$ → DEMAND FUNCTION

$TR = P \cdot Q$
$= (12 - Q) \cdot Q = 12Q - Q^2$

$MR = \frac{dTR}{dQ} = 12 - 2Q$

- AT $Q = 4$, PROFIT IS MAXIMIZED
- IF THE FIRM PRODUCES A QUANTITY IN WHICH $MR > MC'$, THE FIRM CANNOT BE MAXIMIZING ITS PROFIT AS IT COULD INCREASE ITS OUTPUT AND ITS PROFIT WOULD GO UP!
- IF THE FIRM PRODUCES A QUANTITY IN WHICH $MR < MC'$, THE FIRM CANNOT BE MAXIMIZING ITS PROFIT AS IT COULD "DECREASE" ITS OUTPUT AND THEN ITS PROFIT WOULD GO UP!
- THE ONLY SITUATION MONOPOLIST CANNOT IMPROVE ITS PROFIT BY INCREASING OR DECREASING OUTPUT IS WHERE $MR = MC'$. THAT IS, IF $Q^* = 4$ DENOTES THE PROFIT MAXIMIZING OUTPUT, THEN

$$MR(Q^*) = MC'(Q^*)$$

PROFIT MAXIMIZING CONDITION FOR A MONOPOLIST

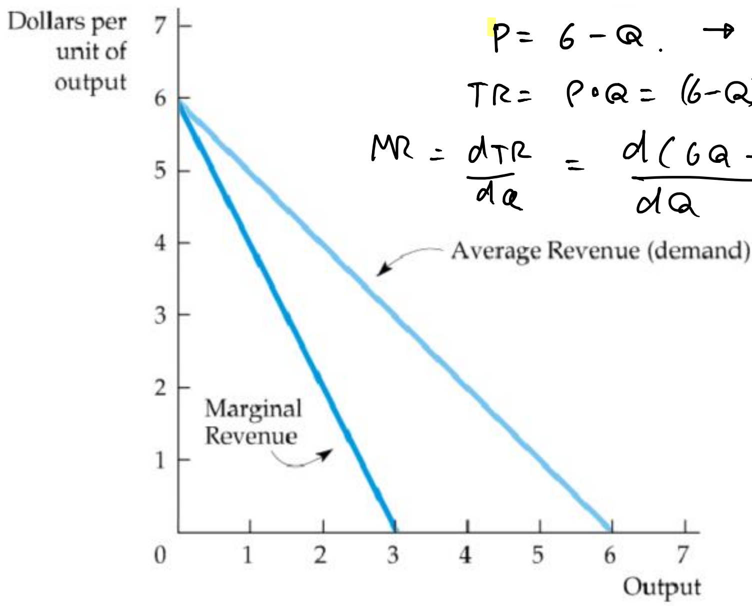
10.1 MONOPOLY

Average Revenue and Marginal Revenue

Figure 10.1

Average and Marginal Revenue

Average and marginal revenue are shown for the demand curve $P = 6 - Q$.



$P = 6 - Q$. → DEMAND FUNCTION

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

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

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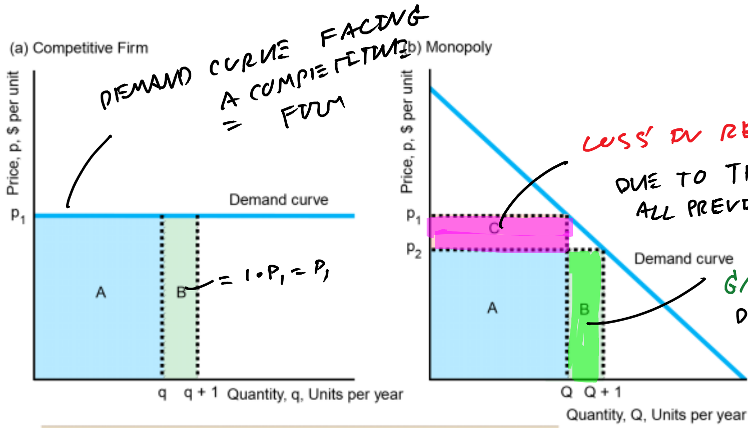
Figure 11.1 Average and Marginal Revenue

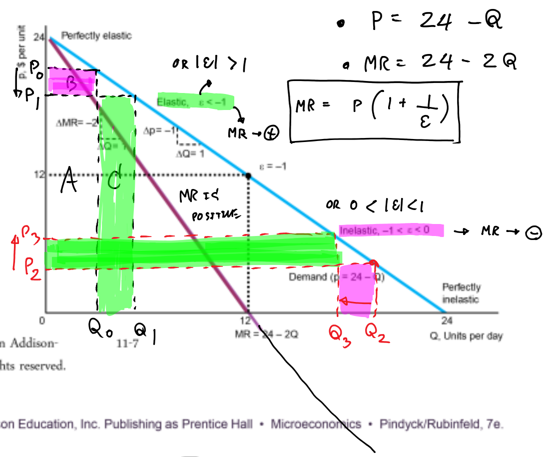


	Initial Revenue, R_1	Revenue with One More Unit, R_2	Marginal Revenue, $R_2 - R_1$
Competition	A	$A + B$	$B = p_1$
Monopoly	$A + C$	$A + B$	$B - C = p_2 - C$

$MR = P_1$ (TRUE ONLY IN PERFECT COMPETITION)

$MR = P_2 - C \Rightarrow MR < P_2$ (IN MONOPOLY)

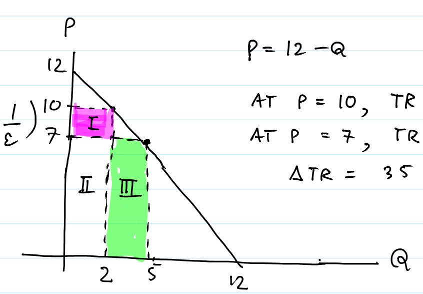
Figure 11.2 Elasticity of Demand and Total, Average, and Marginal Revenue



REGION	MR AND ε	TOTAL REVENUE AND PRICE
ELASTIC ($\lvert\varepsilon\rvert > 1$)	MR > 0	THE MONOPOLIST CAN INCREASE TR BY DECREASING PRICE (AND THEREBY INCREASING QUANTITY BY A SMALL AMOUNT)
UNITARY ELASTIC ($\lvert\varepsilon\rvert = 1$)	MR = 0	
INELASTIC ($\lvert\varepsilon\rvert < 1$)	MR < 0	THE MONOPOLIST CAN INCREASE TR BY INCREASING PRICE (AND THEREBY DECREASING QUANTITY BY A SMALL UNIT)

PROOF

$MR = P\left(1 + \frac{1}{\varepsilon}\right)$



$P = 12 - Q$

AT P = 10, TR = 20 (AREA I + II)

AT P = 7, TR = 35 (AREA II + III)

ΔTR = 35 − 20 = 15 :)

AREA III = ADDITIONAL REVENUE THE MONOPOLIST GETS FROM SELLING ADDITIONAL 3 UNITS OF OUTPUT AT THE NEW LOWER PRICE OF 7 BAHT:

$7 \times (5-2) = 7 \times 3 =$ 21 BAHT.

AREA I = REVENUE THE MONOPOLIST "SACRIFICES" ON THE FIRST 2 UNITS OF OUTPUT IT COULD HAVE SOLD AT THE HIGHER PRICE OF 10 BAHT:

$(10-7) \times 2 =$ 6 BAHT

Δ IN TOTAL REVENUE = AREA III − AREA I

= 21 − 6

= 15 BAHT

⇒ AREA III = PRICE × CHANGE IN QUANTITY

= $P \cdot \Delta Q$ $\qquad 7 \cdot (5-2)$

AREA I = − QUANTITY × CHANGE IN PRICE

$$= -Q \cdot \Delta P$$

THEREFORE, CHANGE IN THE MONOPOLIST'S TOTAL REVENUE IS:

$$\Delta TR = \text{AREA III} - \text{AREA I}$$

$$= P \cdot \Delta Q - (-Q \cdot \Delta P)$$

$$= P \cdot \Delta Q + Q \cdot \Delta P$$

* NOTE: WE PUT MINUS SIGN IN FRONT OF THE EXPRESSION FOR AREA I BECAUSE IF PRICE GOES DOWN AS SHOWN IN THE PICTURE ABOVE, THE CHANGE IN PRICE WILL BE NEGATIVE. THE MINUS SIGN ENSURES THAT THE CALCULATED AREA IS A POSITIVE NUMBER!

i.e.,

$$\boxed{\text{AREA I} = -Q \cdot \Delta P}$$

EX: $\text{AREA I} = -2 \cdot (\overset{\text{NEW}}{7} - \overset{\text{OLD}}{10})$

$$= -2 \cdot (-3)$$

$$= 6$$

$$\Delta TR = 21 - 6 = 15$$

$$\Delta TR = P\Delta Q + Q\Delta P$$

$$MR = \frac{\Delta TR}{\Delta Q} = \frac{P \cdot \Delta Q + Q\Delta P}{\Delta Q}$$

$$\boxed{MR = P + Q \cdot \frac{\Delta P}{\Delta Q}}$$

(1) MR CONSISTS OF 2 PARTS:

FIRST PART: P → REFLECTS INCREASE IN TR DUE TO HIGHER VOLUME → MARGINAL UNITS SOLD. (AREA III)

SECOND PART: $Q \cdot \frac{\Delta P}{\Delta Q}$ → WHICH IS NEGATIVE (WHY?) B/C ΔP IS NEGATIVE

→ REFLECTS "DECREASE IN TR DUE TO THE REDUCED PRICE OF THE ALL PREVIOUS

UNITS. (= AREA I)

$\varepsilon = \frac{\% \Delta Q}{\% \Delta P}$

$= \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}$

FROM $MR = P + Q \frac{\Delta P}{\Delta Q}$

$MR = P + Q \frac{\Delta P}{\Delta Q} \cdot \frac{P}{P}$

$$MR = P\left[1 + \frac{1}{\varepsilon}\right]$$

SINCE $\varepsilon = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$.