Intro Micro | MiniExam E Demo

Question | Breaking Up A Monopoly

Suppose the demand for a good X is given by

$$P = 100 - Q \qquad Q = q_A$$

with a single seller A producing X at a constant marginal cost of 10. The marginal revenue for A is

$$MR_A = 100 - 2q_A$$

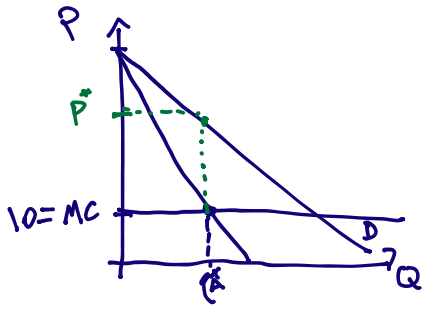
$ATC = 10$

$MC_A = 10$

Prices are in galleons.

Q1 | Equilibrium Quantity

What quantity of X should A supply?



$MC = MR \Rightarrow q_A^*$

$10 = 100 - 2q_A$

$2q_A^* = 90$

$q_A^* = 45$

Q2 | Equilibrium Price

What price should A charge?

$P = 100 - q_A = 100 - 45$

$P^* = 55$

Q3 | Profit

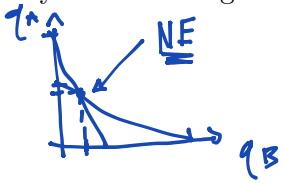
What profit will A generate?

$\Pi = q_A(P^* - ATC) = 45(55-10)$

$\Pi^* = 45^2 > 0$

Q4 | Post Breakup Quantity

Due to it's strangle-hold on the market, the Commerce branch of the Ministry of Magic imposed a heavy-handed breakup of A into two companies, B and C, both with a marginal cost of 10 and with symmetric marginal revenue:



$$MR_B = 100 - 2q_B - q_C \qquad MC_B = 10$$
$$MR_C = 100 - 2q_C - q_B \qquad MC_C = 10$$

Find the Nash Equilibrium quantity of X supplied by B.

FIRM B: $MR_B = MC_B$

$10 = 100 - 2q_B - q_C$

$2q_B = 90 - q_C$

$BR_B: q_B = 45 - \frac{1}{2}q_C$

FIRM C: $MC_C = MR_C$

$BR_C: q_C = 45 - \frac{1}{2}q_B$

NE

$q_B = 45 - \frac{1}{2}(45 - \frac{1}{2}q_B)$

$= 45 - \frac{45}{2} + \frac{1}{4}q_B$

$(1 - \frac{1}{4})q_B = \frac{90}{2} - \frac{45}{2} = \frac{45}{2}$

$2\frac{3}{4}q_B = \frac{45}{2}$

$q_B = \frac{90}{3} = 30$

$q_B = 30$

Q5 | Post Breakup Market Equilibrium Quantity

What is the market equilibrium quantity in the market? Is quantity less than, equal to, or greater than quantity before the breakup?

$Q = q_B + q_C = 30 + 30$

$Q = 60$

Quantity has gone up after the breakup!

Q6 | Post Breakup Price

What the market price in market after the breakup? Is price less than, equal to, or greater than profit before the breakup?

$P = 100 - 60$

$P^* = 40$

Prices have gone down!

Q7 | Post Breakup Profit

What the total profit (from both firms) in this market? Is profit less than, equal to, or greater than profit before the breakup?

$\Pi_B = 30(40-10) = 900 = \Pi_C$

$\Pi = \Pi_B + \Pi_C = 900 + 900$

$\boxed{\Pi = 1800}$

$\Pi^M = 45^2$

$< 45^2$

Profits have gone down.