HOMEWORK 3

Example 2.I: A monopolist firm faces the market demand given by $P = 10 - Q$. Consider the following questions if the cost function $C(Q) = 4Q$.

P(Q)

↳ TC

- What is the revenue-maximizing level of output?

revenue function

$TR(Q) = P(Q) \times Q$

$= (10 - Q) \times Q$

$= 10Q - Q^2$

At $Q = 5$, TR is max

$TR = 25$

slope : $\frac{\partial TR}{\partial Q} = 10 - 2Q$

maximum occurs

when $\frac{\partial TR}{\partial Q} = 0$

$10 - 2Q = 0$

$Q = 5$

- What is the break-even output? → Find point $\pi = 0$ → $TR = TC$

HW1

$TC = 4Q \times Q$

$TR = TC$

$10Q - Q^2 = 4Q \times Q$

$10Q - Q^2 = 4Q^2$

$10Q = 5Q^2$

$2 = \frac{Q^2}{Q}$

$2 = Q$ #

HW2

- What is the profit-maximizing level of output?

① $MR = MC$

$MC = \frac{\Delta TC}{\Delta Q} = 4$

② $\pi = TR - TC$

$\pi = 10Q - Q^2 - 4Q^2$

$= 10Q - 5Q^2$

$\frac{\partial \pi}{\partial Q} = 0 \rightarrow Q^*$

$\frac{\partial \pi}{\partial Q} = 10 - 10Q$

$10 - 10Q = 0$

$10 = 10Q$

$Q = 1$ #