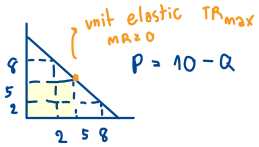
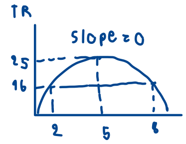



TR = P × Q
= 10Q − Q²
Slope of TR = ΔTR/ΔQ
= MR

Thus, revenue max MR = 0
condition is

**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)

- What is the revenue-maximizing level of output?

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

$= (10 - Q) \times Q$

$= 10Q - Q^2$

slope $= \frac{dTR}{dQ} = 10 - 2Q$

maximum occurs when $\frac{dTR}{dQ} = 0$

$10 - 2Q = 0$

$Q = 5$

$0 = 10 - 2Q$

$-10 = -2Q$

$5 = Q$

50 − 25
= 25 ✓

At Q = 5, TR is max
TR = 25

- What is the break-even output?

profit is 0

$\pi = 0 \rightarrow TR = TC$

$0 = TR - TC$

$0 = [(10 - Q) \times Q] - [4Q]$

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

$0 = 6Q - Q^2$

$0 = Q(6 - Q)$

$Q = 0, 6$

At Q = 0, 6 is break-even output.

- What is the profit-maximizing level of output?

① MR = MC

$\frac{\Delta TR}{\Delta Q} = \frac{\Delta TC}{\Delta Q}$

$4 = 10 - 2Q$

$6 = 2Q$

$3 = Q$

② $\pi = TR - TC$

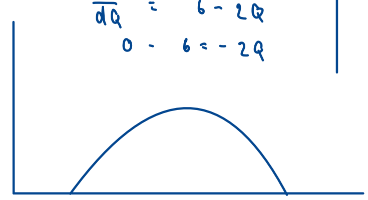
$\pi = 10Q - Q^2 - 4Q$

$\pi = 6Q - Q^2$

$\frac{d\pi}{dQ} = 6 - 2Q$

$0 = 6 - 2Q$

$3 = Q$



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