

○ What is the break-even output?

$$TR = TC$$

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

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

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

$$\frac{6Q}{Q} = \frac{Q^2}{Q}$$

$$6 = Q$$

∴ break-even output is $Q = 6$

○ What is the profit-maximizing level of output?

1. $MC = MR$

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

$$4 = 10 - 2Q$$

$$2Q = 6$$

$$Q = 3$$

2. $\pi = TR - TC$

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

$$\pi = 6Q - Q^2$$

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

$$0 = 6 - 2Q$$

$$2Q = 6$$

$$Q = 3$$