

3. Consider total cost and total revenue given in the following table:

Quantity	0	1	2	3	4	5	6	7
Total cost	\$8	9	10	11	13	19	27	37
Total revenue	\$0	8	16	24	32	40	48	56

- Calculate profit for each quantity. How much should the firm produce to maximize profit?
- Calculate marginal revenue and marginal cost for each quantity. Graph them. (*Hint*: Put the points between whole numbers. For example, the marginal cost between 2 and 3 should be graphed at $2\frac{1}{2}$.) At what quantity do these curves cross? How does this relate to your answer to [part \(a\)](#)?
- Can you tell whether this firm is in a competitive industry? If so, can you tell whether the industry is in a long-run equilibrium?

7. A profit-maximizing firm in a competitive market is currently producing 100 units of output. It has average revenue of \$10, average total cost of \$8, and fixed cost of \$200.

- What is its profit?
- What is its marginal cost?
- What is its average variable cost?
- Is the efficient scale of the firm more than, less than, or exactly 100 units?

i.e. Is AC at its minimum?

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in ATC

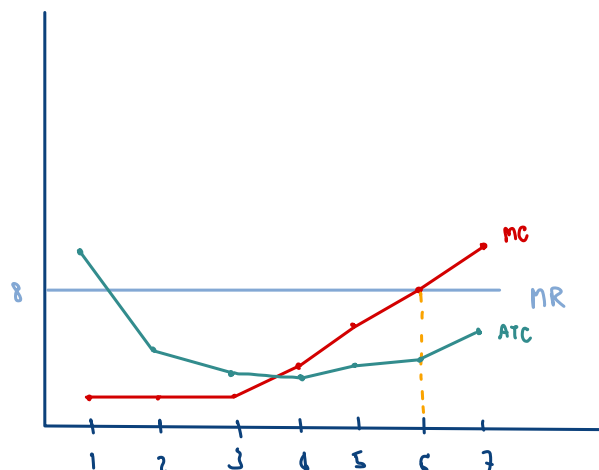
(a.)

Quantity	0	1	2	3	4	5	6	7
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Q	TC	TR	$\frac{\Delta TR}{\Delta Q}$ MR	$\frac{\Delta TC}{\Delta Q}$ MC	MR-MC Marginal profit	$\frac{TC}{Q}$ ATC
0	8	0	-	-	-	-
1	9	8	8	1	7	9
2	10	16	8	1	7	5
3	11	24	8	1	7	3.7
4	13	32	8	2	6	3.25
5	19	40	8	5	3	3.8
6	27	48	8	8	0	4.5
7	37	56	8	10	-2	5.25

$\therefore$ Firm should produce $Q = 6$ *

(b.)



at $Q = 6$ $TR = 48$ $TC = 27$ $\therefore$ profit = 21.

(c.) - yes because this firm is a price taker.

$$\therefore \text{marginal revenue} = p = 10$$

this graph is short-run, because long-run equilibrium profit must = 0

$$Q = 100$$

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→ graph of MC

$$P = AR = MR = 10$$

$$(a) \pi = TR - TC$$

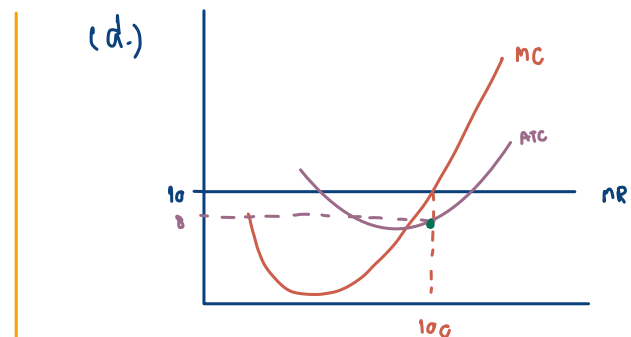
$$\pi = (p \cdot q) - [ATC \cdot Q]$$

$$\pi = 10 \cdot (100) - 8 \cdot (100) = 200$$

$$(b) MC = MR$$

$$\therefore MR = 10$$

$$MC = 10$$



Ans. No, because AC at minimum must on MC curve.

$$(c) VC = AVC \cdot Q$$

$$(1.) AVC = ATC - AFC$$

$$AVC = ATC - \frac{FC}{Q}$$

$$AVC = 8 - \frac{200}{100}$$

$$AVC = 6$$

$$6 \cdot 100 = 600 = VC$$