

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?

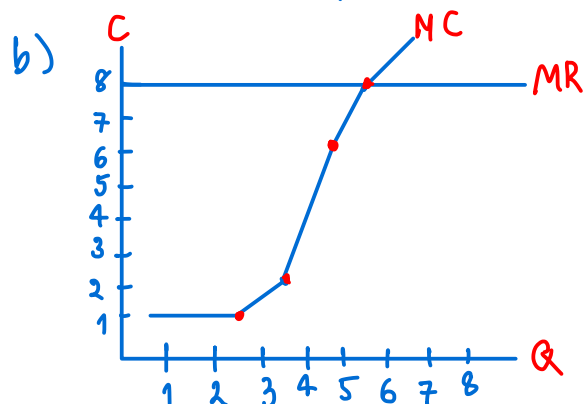
i.e. Is AC at its minimum?

③

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

Profit	-8	-1	6	13	19	21	21	19
Marginal revenue	8	8	8	8	8	8	8	8
Marginal cost	1	1	1	1	2	6	8	10

a) The firm produce the maximum profits at $Q = 5, 6$



c) This industry is competitive because marginal revenue is the same for each quantity.
The industry is not long-run equilibrium because profits $\neq 0$

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a)
$$\text{Profits} = (10 \times 100) - (8 \times 100)$$
$$= 200$$

b)
$$\text{Marginal Revenue (MR)} = \text{Average Revenue (AR)}$$

According to the profit maximization objective, $MR = MC$

So, Marginal cost is equal to Marginal Revenue which is 10\$

c)
$$\text{Average variable cost} = \frac{\text{variable cost}}{\text{quantity}} = \frac{600}{100} = 6$$

Noted that
$$\text{variable cost} = \text{total cost} - \text{fixed cost}$$
$$= (8 \times 100) - (200) = 600$$

d) The average total cost is 8 \$, The marginal cost is 10\$. So ATC is less than MC, So an efficient scale of production will be when the firm produce is less than 100 units of output.