

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

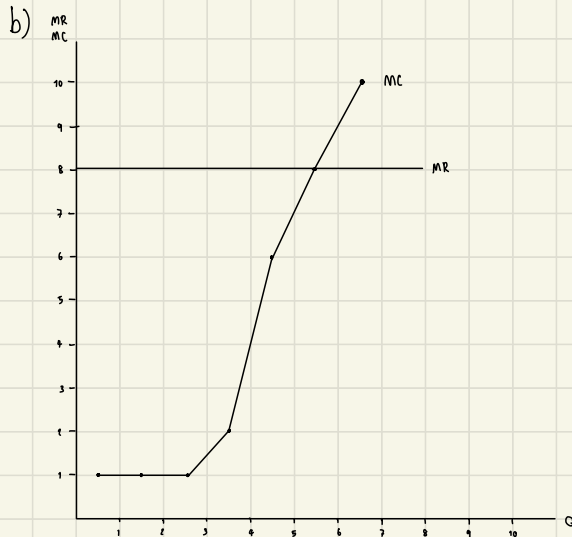
Quantity Q	0	1	2	3	4	5	6	7
Total cost TC	\$8	9	10	11	13	19	27	37
Total revenue TR	\$0	8	16	24	32	40	48	56

- 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?

$$d) \pi(Q) = TR(Q) - TC(Q)$$

Quantity Q	0	1	2	3	4	5	6	7
Total cost $TC(Q)$	\$8	9	10	11	13	19	27	37
Total revenue $TR(Q)$	\$0	8	16	24	32	40	48	56
Profit	-8	-1	6	13	19	21	21	19

$\therefore$ The firm should either produce 5 or 6 units of products to maximize the profit



Equilibrium sufficient conditions

a) $MR = MC$

b) $\text{slope of } MR < \text{slope of } MC$

MR and MC intersect between quantity of 5 and 6.

So, this support a)

- c) This firm is competitive since marginal rev. is the same for each quantity. So the industry is not in long-run equilibrium, since profit is positive

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?

a) profit $\Pi = TR - TC$

$$TR = AR \times Q = 10 \times 100 = 1,000$$

$$TC = AC \times Q = 8 \times 100 = 800$$

$$\text{profit} = 200$$

b) In perfect competitive equilibrium $MR = MC \Rightarrow$ so, $MC = 10$

c) as fixed cost = 200

producing (a) = 100

average fixed cost = 2

$$AVC = AC - AFC$$

$$AVC = 8 - 2$$

$$AVC = 6$$

d) $AC = 8$ $MC = 10$

So, $AC < MC$

AC is not minimum, if you want AC is minimum $MC = AC$

The efficient scale is less than 100 units