

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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d

Quantity :	0	1	2	3	4	5	6	7
Profit :	-8	-1	6	13	19	21	21	19

$$\text{Profit} = \text{total revenue} - \text{total cost}$$

Profit maximizing output = 100 units

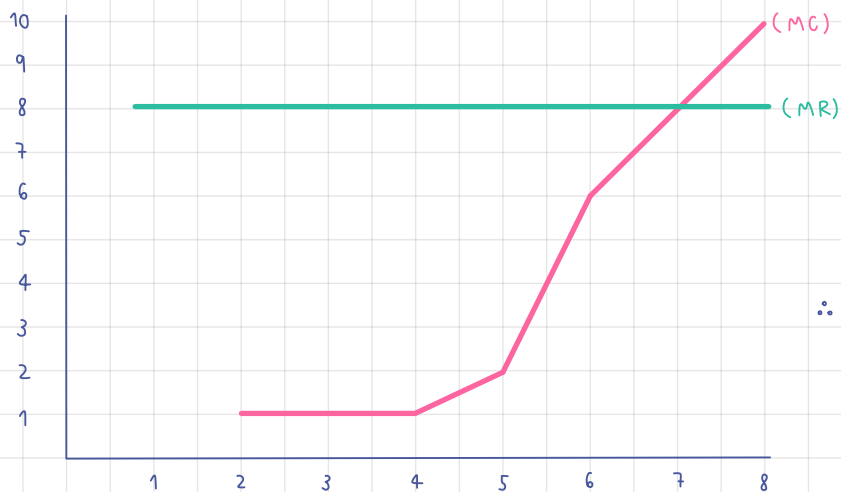
b.

Quantity :	0	1	2	3	4	5	6	7
total revenue :	0	8	16	24	32	40	48	56
Marginal revenue :	8	8	8	8	8	8	8	8

$$\frac{\text{change in revenue}}{\text{change in Quantity}} = \text{Marginal revenue}$$

Quantity :	0	1	2	3	4	5	6	7
total cost :	8	9	10	11	13	19	27	37
Marginal cost :	1	1	1	1	2	6	8	10

$$\frac{\text{change in cost}}{\text{change in Quantity}} = \text{Marginal cost}$$



∴ two are cross at quantities of 7 (7, 8)

c. No, Because the revenue is constant and the benefits is positive

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a. $Q = 100$
 $AR = 10$
 $ATC = 8$
 $FX = 200$

$$\begin{aligned}\text{Profit} &= AR \cdot Q - ATC \cdot Q \\ &= 10 \cdot 100 - 8 \cdot 100 \\ &= 1000 - 800 \\ &= 200\end{aligned}$$

b.

$$\text{Marginal cost} = \frac{\text{change in cost}}{\text{change in Quantity}}$$

$$\begin{aligned}MC &= MR = P \\ &= 10\end{aligned}$$

c.

$$AFC = \frac{200}{100} = 2$$

$$\begin{aligned}AVC &= ATC - AFC \\ &= 8 - 2 \\ &= 6\end{aligned}$$

d. $Q = 100$
 $AR = 10$
 $ATC = 8$
 $FX = 200$

The efficient scale is $MC = AVC$

