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HW#11 Due November 24, 2020

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

a. Calculate profit for each quantity. How much should the firm produce to maximize profit?

b. 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 $2\,{}^1/_2$.) At what quantity do these curves cross? How does this relate to your answer to part (a)?

c. 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.

a. What is its profit?

b. What is its marginal cost?

c. What is its average variable cost?

d. 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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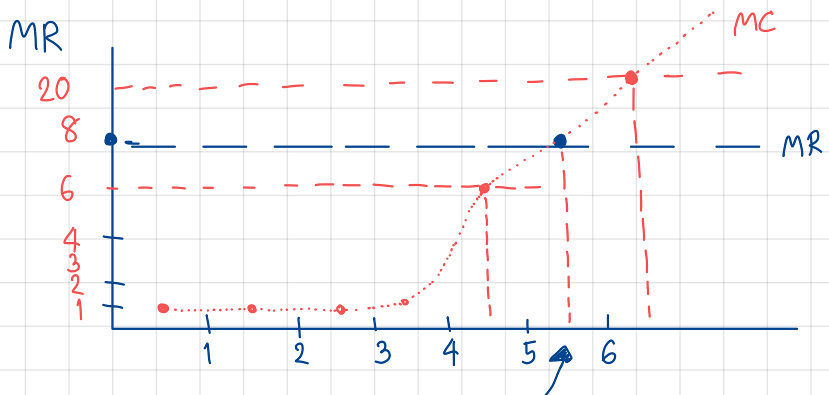
(3.a)

Q	0	1	2	3	4	5	6	7
TC	8	9	10	11	13	19	27	37
TR	0	8	16	24	32	40	48	56
Profit	-8	-1	6	13	19	21	21	19

(3.b)

Q	0	1	2	3	4	5	6	7
TC	8	9	10	11	13	19	27	37
MC		1	1	1	2	6	8	10

TR	0	8	16	24	32	40	48	56
MR		8	8	8	8	8	8	8



MR = MC at Q = 5.5 This relates to (3.a) where profit is maximized at Q between 5 and 6

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(7.a) Profit $= Q \cdot (AR - AC) = 100(10 - 8) = \$200$

(7.b) Since the quantity $Q = 100$ is where the price is maximizing its profit $MR = MC$.

$\therefore MC = \$10$

(7.c) Total cost $= TC = AR \cdot Q = 8 \cdot 100 = 800$

Total Fixed cost $= TFC$ is $\$200$ as given.

$\therefore$ Total variable cost $= TVC = TC - TFC = 800 - 200 = 600$

Average variable cost $= AVC = \frac{TVC}{Q} = \frac{600}{100} = \$6$

(7.d) At $Q = 100$, we have profit $= \$200 > 0$ because $AR > AC$

Since $AR = MR = MC$, at $Q = 100$, $MC > AC$

when $MC > AC$, we will have AC increasing.

Thus $Q = 100$ is greater than the quantity that is the most efficient when AC is min.