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?

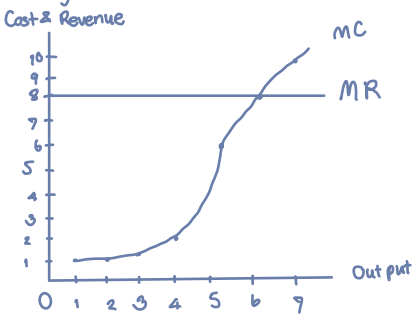
$\Pi = TR - TC$

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

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

$MR = \frac{\Delta TR}{\Delta Q}$

Quantity	0	1	2	3	4	5	6	7
Marginal revenue		8	8	8	8	8	8	8
Marginal cost		1	1	1	2	6	8	10



∴ At $Q = 6$, $P = 8$ is a equilibrium point

It is related to part (a) when $Q = 6$, the profit = 21 because it is max point that they can make most profit.

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?

Yes, this firm is in a competitive industry because they can sell at equilibrium price and cannot make any sell if the price is higher.

Yes, the firm is in a long-run equilibrium. Because the curve MC is tangential to to market price.

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?

a) Total Revenue = AR × Q
= 10 × 100
= 1,000

Total Cost = ATC × Q
= 8 × 100
= 800

Profit = TR − TC = 1,000 − 800 = 200 #

b) Marginal Cost = $\frac{800}{100}$ = 8 #

c) TC = FC + VC

VC = TC − FC

Valuable cost = 800 − 200
= 600

AVC = $\frac{VC}{Q}$

= $\frac{600}{100}$

= 6 #

d) It it efficient scale of the firm exactly 100 units.