

HW#11 Due November 24, 2020

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

|                      |     |   |    |    |    |    |    |    |
|----------------------|-----|---|----|----|----|----|----|----|
| <b>Quantity</b>      | 0   | 1 | 2  | 3  | 4  | 5  | 6  | 7  |
| <b>Total cost</b>    | \$8 | 9 | 10 | 11 | 13 | 19 | 27 | 37 |
| <b>Total revenue</b> | \$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      | 0   | 1 | 2  | 3  | 4  | 5  | 6  | 7  |
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- 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?

a)

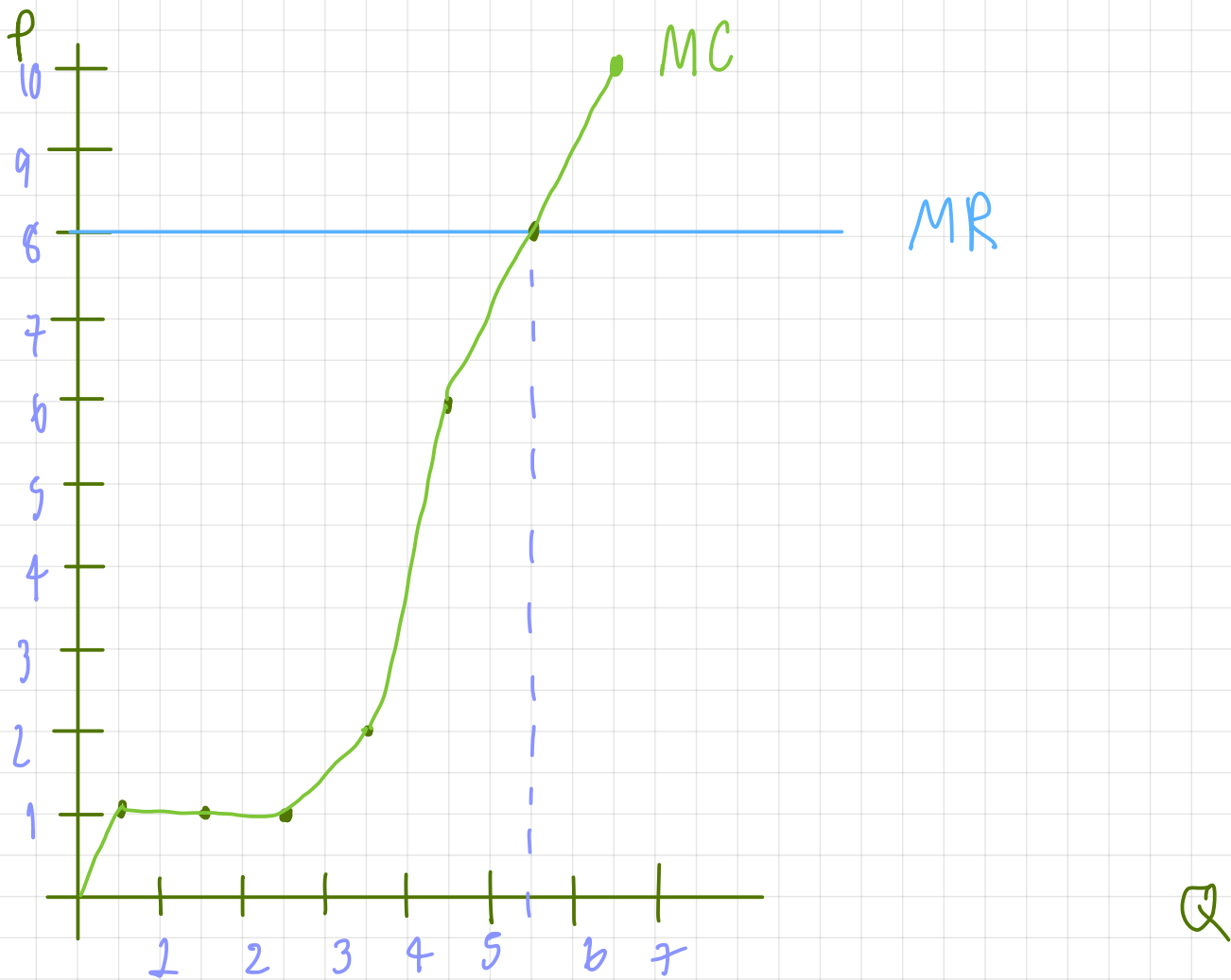
| Quantity | TC | TR | Profit |
|----------|----|----|--------|
| 0        | 8  | 0  | -8     |
| 1        | 9  | 8  | -1     |
| 2        | 10 | 16 | 6      |
| 3        | 11 | 24 | 13     |
| 4        | 13 | 32 | 19     |
| 5        | 19 | 40 | 21*    |
| 6        | 27 | 48 | 21*    |
| 7        |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

$$\text{Profit} = \text{TR} - \text{TC}$$

At 5 and 6 quantity the profit are 21, therefore, firm should produce 5 or 6 quantity to maximizing profit.

b)

| Quantity | TC | MC   | TR | MR  |
|----------|----|------|----|-----|
| 0        | 8  | > 1  | 0  | > 8 |
| 1        | 9  | > 1  | 8  | > 8 |
| 2        | 10 | > 1  | 16 | > 8 |
| 3        | 11 | > 1  | 24 | > 8 |
| 4        | 13 | > 2  | 32 | > 8 |
| 5        | 19 | > 6  | 40 | > 8 |
| 6        | 27 | > 8  | 48 | > 8 |
| 7        | 37 | > 10 | 56 | > 8 |



At quantity  $5\frac{1}{2}$  marginal revenue and marginal cost curve cross. This relate to my answer in part (a) because at the quantity that MR is greater than marginal cost firm would want to produce more to increased profit. On the other hand if the marginal cost is greater than marginal revenue the firm would want to produce less because produce one more quantity's cost don't worth the profit. There for, at quantity that marginal cost equal marginal revenue, it will maximize profit.

③ This firm is competitive firm because the firm is a price taker and don't have power over the market. The industry is in the longrun because there's a fix cost even producing nothing the firm still have to pay \$8

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?*

① 100 units of output.  
average revenue = \$10  $\rightarrow$  total revenue  
 $= AR \times \text{quantity of output}$   
 $= \$10 \times 100$   
total revenue = \$1000  
average total cost = \$8  $\rightarrow$  total cost  
 $= AC \times \text{quantity of output}$   
 $= 8 \times 100$   
total cost = 800\$  
 $\therefore$  profit = total revenue - total cost  
 $= 1000 - 800$   
 $= 200\$$

(b) marginal cost

producing 0 unit cost \$200  
producing 100 unit cost \$800  
producing 1 more unit would cost \$6

$MC = 600$

$\therefore$  marginal cost of producing 1 more quantity is equal 6 dollar

(c) average variable cost

total cost - fixed cost = variable cost

$$800 - 200 = 600$$

$$AVC = \frac{TVC}{100}$$

$$AVC = \frac{600}{100} = 6 \text{ dollar}$$

(d)

average total cost \$8 (at Q=100)

Total cost = fixed cost + 6 (quantity)

$$= 200 + 6X$$

At Q=99 would cost \$794

At Q=100 would cost \$800

$MC = 6 \text{ dollar}$

$\therefore$  the efficiency of the firm is less than 100 unit at quantity that MC curve intersect AC curve.