



# Microeconomics

## Unit 3 Practice Sheet ([Video Help](#))

**Part 1: Production Function-** Use the table to answer the questions.

|                   |   |   |    |    |    |    |    |
|-------------------|---|---|----|----|----|----|----|
| Number of workers | 0 | 1 | 2  | 3  | 4  | 5  | 6  |
| Total Product     | 0 | 8 | 20 | 26 | 29 | 30 | 25 |

1. What is the marginal product of the 4th worker? Show your work. **3 units =  $(29-26)/(4-3)$  = the change in TP divided by the change in number of workers**
2. After which worker does the law of diminishing marginal returns set in? Why? **After the 2nd worker. This is when the marginal product begins to decrease.**

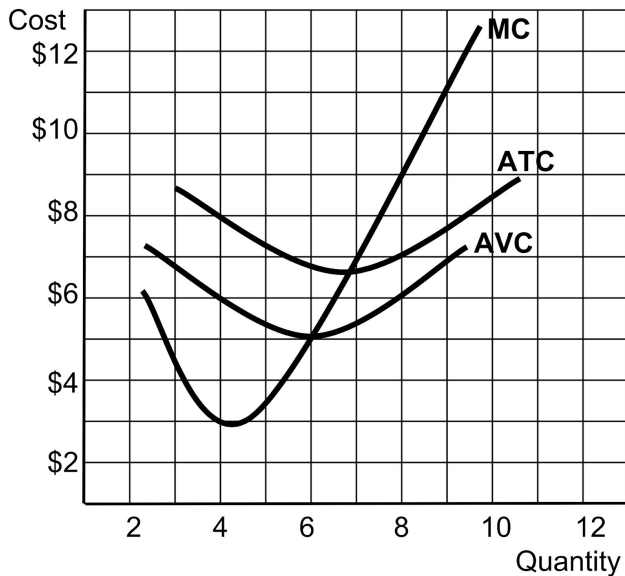
### Part 2: Costs of

**Production-** Fill in the blanks in the chart and answer the question.

3. Why does the marginal cost of each unit initially fall then increase as more units are produced? **The law of diminishing marginal returns**

| Quantity | Total Cost | Marginal Cost | Average Total Cost | Average Variable Cost | Average Fixed Cost |
|----------|------------|---------------|--------------------|-----------------------|--------------------|
| 0        | \$20       | -             | -                  | -                     | -                  |
| 1        | \$30       | \$10          | \$30               | \$10                  | \$20               |
| 2        | \$32       | \$2           | \$16               | \$6                   | \$10               |
| 3        | \$38       | \$6           | \$12.67            | \$6                   | \$6.67             |
| 4        | \$45       | \$7           | \$11.25            | \$6.25                | \$5                |
| 5        | \$55       | \$10          | \$11               | \$7                   | \$4                |
| 6        | \$70       | \$15          | \$11.67            | \$8.33                | \$3.33             |
| 7        | \$90       | \$20          | \$12.86            | \$10                  | \$2.86             |

**Part 3: Cost Curves-** Use the graph below to answer the questions. Show your work.



4. What is the marginal cost of the 8th unit? **\$9 (given on graph)**
5. Calculate the fixed cost of producing 4 units? **\$8 =  $AFC \times \text{quantity} = \$2 \times 4$**
6. Calculate the total variable cost of producing 9 units? **\$63 =  $AVC \times \text{quantity} = \$7 \times 9$**
7. Calculate the total cost of producing 9 units? **\$71 =  $\text{fixed cost} + \text{variable cost} = \$8 + \$63$**
8. Calculate the average fixed cost of 8 units? **\$1 =  $\text{fixed cost}/\text{quantity} = \$8/8$**
9. Why does the marginal cost (MC) intersect the average total cost (ATC) at the ATC's minimum? **When the marginal cost is below the ATC it pulls the ATC down. When MC is above ATC it pulls ATC up.**

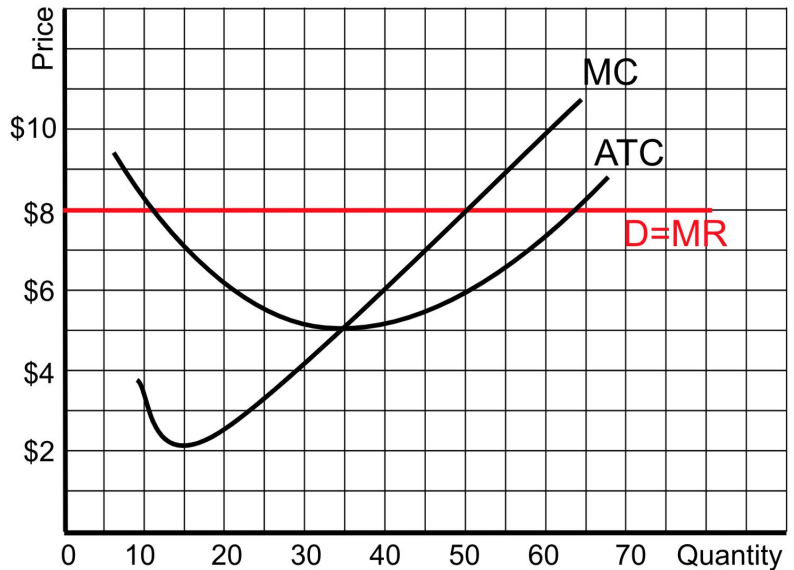


# Microeconomics

## Unit 3 Practice Sheet ([Video Help](#))

**Part 4: Perfect Competition-** Use the graph below for a perfectly competitive firm to answer the questions.

- If the price is \$8, what is the profit maximizing quantity? **Q = 50**
- Calculate the total cost at the profit maximizing quantity. **\$300 = ATC x Q = \$6 x 50**
- Calculate the profit or loss at the profit maximizing quantity. **\$100 profit = TR - TC = \$400 - \$300**
- How much profit will this firm earn if they increase the price \$2 higher than the market price? **\$0. No one will buy. The firm is a price taker.**
- What is the profit maximizing price and quantity in the long-run? **P= \$5, Q= 35**



- If the market price is \$5, will the firm earn economic profit, accounting profit, neither, or both? Why? **Accounting profit only. No economic profit because it would be at long-run equilibrium. TR = TC.**

**Part 2: Chart Practice -** Use the chart to answer the questions.

- If the market price is \$15, what is the profit maximizing quantity? **5 Units (MR=MC)**
- Calculate the total revenue at the profit maximizing quantity. **\$75 = P(\$15) x Q(5)**
- Calculate the profit or loss at the profit maximizing quantity. **Profit of \$21 = TR - TC = \$75 - \$54**
- Calculate the profit or loss of producing 7 units. **Profit of \$15 = TR - TC = \$105 - \$90**
- Calculate the profit or loss of producing 3 units. **Profit of \$11 = TR - TC = \$45 - \$34**
- Assume that the market price fell to \$10. Calculate the profit or loss at the profit maximizing quantity. **Loss of \$2 = TR - TC = \$40 - \$42 (\*note\* they will produce 4 units, where MR = MC)**

| Quantity | Total Cost | Marginal Cost |
|----------|------------|---------------|
| 0        | \$20       | -             |
| 1        | \$25       | \$5           |
| 2        | \$28       | \$3           |
| 3        | \$34       | \$6           |
| 4        | \$42       | \$8           |
| 5        | \$54       | \$12          |
| 6        | \$70       | \$16          |
| 7        | \$90       | \$20          |

- If the market price is \$10, should this firm shut down in the short-run? Why or why not? **They should NOT shut down. They should continue to produce because they are covering some of their fixed cost. If they shut down they will lose \$20 (their fixed cost). If they produce they lose only \$2.**