Microeconomics
Unit 3 Practice Sheet

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

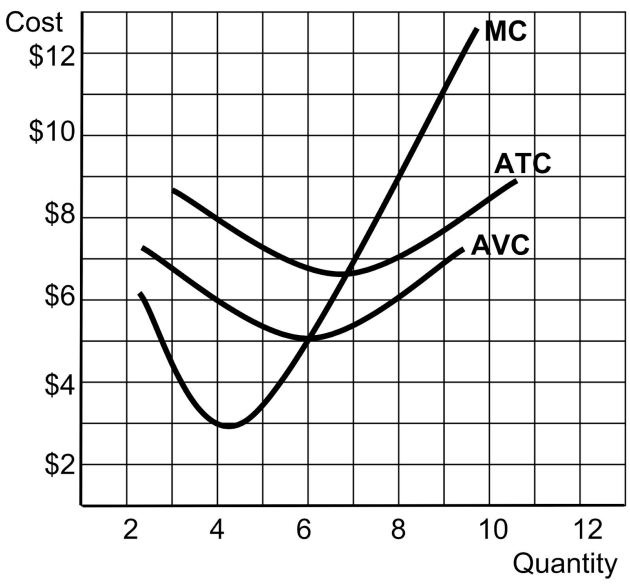
1. What is the marginal product of the 4th worker? Show your work. 3 units = (29-26)/(4-3) = the change in TP divided by the change in number of workers
2. After which worker does the law of diminishing marginal returns set it? Why? After the 2nd worker. This is when the marginal product begins to decrease.

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 x quantity = $2 x 4
6. Calculate the total variable cost of producing 9 units? $63 = AVC x quantity = $7 x 9
7. Calculate the total cost of producing 9 units? $71 = fixed cost + variable cost = $8 + $63
8. Calculate the average fixed cost of 8 units? $1 = fixed cost/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.

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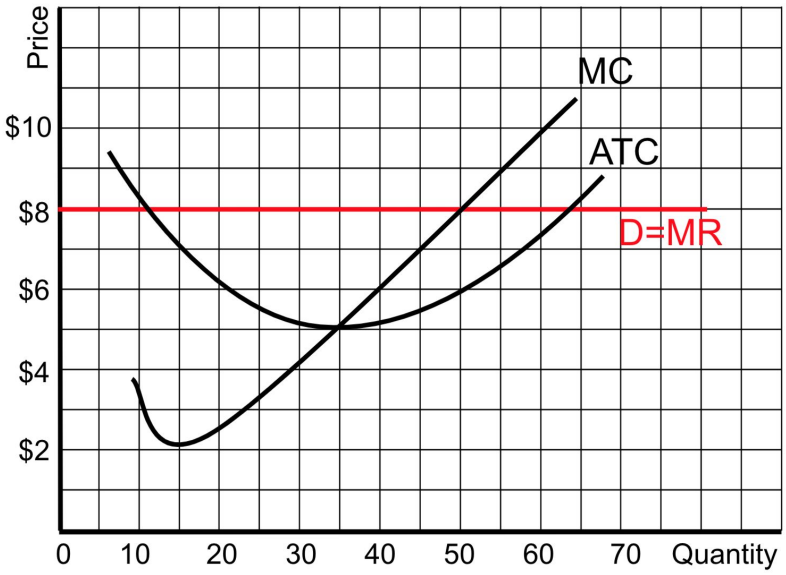
Part 4: Perfect Competition- *Use the graph below for a perfectly competitive firm to answer the questions.*



10. If the price is $8, what is the profit maximizing quantity? Q = 50
11. Calculate the total cost at the profit maximizing quantity. $300 = ATC x Q = $6 x 50
12. Calculate the profit or loss at the profit maximizing quantity. $100 profit = TR - TC = $400 - $300
13. 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.
14. What is the profit maximizing price and quantity in the long-run? P= $5, Q= 35
15. 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.*

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

16. If the market price is $15, what is the profit maximizing quantity? 5 Units (MR=MC)
17. Calculate the total revenue at the profit maximizing quantity. $75 = P($15) x Q(5)
18. Calculate the profit or loss at the profit maximizing quantity. Profit of $21 = TR - TC = $75 - $54
19. Calculate the profit or loss of producing 7 units. Profit of $15 = TR - TC = $105 - $90
20. Calculate the profit or loss of producing 3 units. Profit of $11 = TR - TC = $45 - $34
21. 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)
22. 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.