



## AP<sup>®</sup> Microeconomics 2001 Sample Student Responses

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### Question 3

3MICCLB.

Write in the box the number of the question you are answering on this page as it is designated in the examination.

# of workers	# of Cars washed	MP	<del>MP</del> MRP = MP x P
0	0	0	0
1	15	15	90
2	35	20	120
3	60	25	150
4	75	15	90
5	85	10	60
6	80	-5	-30

a) As shown by the table, marginal product is maximized with the third worker, who has a marginal product of 25 cars washed per day.

b) Marginal product eventually decreases due to the principle of diminishing marginal returns. This principle states that when a variable input, such as workers, is added to a fixed input, such as the Sparkle Car wash facility, the marginal product of the variable input will decrease after a certain point. This is due to the fact that there will not be enough of the fixed input available to make efficient use of the variable input.

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Question 3

c) Sparkle would never ~~buy~~ hire the sixth worker because his marginal product, and hence his marginal revenue product, is negative. Since firms will only hire a worker if his marginal revenue product is higher than his wage, and this worker's wage must be greater than zero and hence higher than his marginal revenue product, the firm will never hire him.

d) Since firms will only hire workers if their marginal revenue product is greater than or equal to their wage, and the marginal revenue product, the marginal product of the worker times the price of the output, is \$90, the highest wage Sparkle would be willing to pay the fourth worker is \$90.

Write in the box the number of the question you are answering on this page as it is designated in the examination.

3MICLLC

3

3 MIC G1

a) Worker 1 - Marginal product = 15

" 2 " " = 20

" 3 " " = 25

" 4 " " = 15

Marginal product = additional output / new worker hired

∴ Marginal product is maximized @ Worker 3

b) Law of diminishing marginal returns: There is a certain point when <sup>additional</sup> inputs become detrimental to the firm. For example, hiring extra workers may end up in too many workers trying to do the same job b/c there is no extra work for extra workers. Extra workers will get in the way & marginal product will decrease due to inefficiency.

c) Marginal Product for Worker 6 is negative (-5)

meaning that output is actually decreasing.

∴ He/she would never be hired b/c production decreases.

d) \$90

Marginal product of Worker 4 (15) × Price (\$6) = \$90/day

Question #3

Write in the box the number of the question you are answering on this page as it is designated in the examination.

3MICELH

a) Worker #3

b) The Law of Diminishing Returns illustrates the fact that efficiency reaches a peak and then returns diminish.

c) Because this would be extremely poor resource management and, assuming Sparkle is neither corrupt nor staffed by incompetent managers, it would be decided against.

d) \$80. This is effectively the production of the 4<sup>th</sup> worker as compared to the productivity of the 3<sup>rd</sup> worker.