

4. Nimbus, Inc., makes brooms and then sells them door-to-door. Here is the relationship between the number of workers and Nimbus's output during a given day:

Workers	Output	Marginal Product	Total Cost	Average Total Cost	Marginal Cost
0	0		<u>200</u>	<u>0</u>	
		<u>20</u>			<u>5</u>
1	20		<u>300</u>	<u>15</u>	
		<u>30</u>			<u>3.34</u>
2	50		<u>400</u>	<u>8</u>	
		<u>40</u>			<u>2.5</u>
3	90		<u>500</u>	<u>5.56</u>	
		<u>30</u>			<u>3.34</u>
4	120		<u>600</u>	<u>5</u>	
		<u>20</u>			<u>5</u>
5	140		<u>700</u>	<u>5</u>	
		<u>10</u>			<u>10</u>
6	150		<u>800</u>	<u>5.34</u>	
		<u>5</u>			<u>20</u>
7	155		<u>900</u>	<u>5.81</u>	

- Fill in the column of marginal products. What pattern do you see? How might you explain it?
- A worker costs \$100 a day, and the firm has fixed costs of \$200. Use this information to fill in the column for total cost.
- Fill in the column for average total cost. (Recall that  $ATC = TC/Q$ .) What pattern do you see?
- Now fill in the column for marginal cost. (Recall that  $MC = \Delta TC / \Delta Q$ .) What pattern do you see?

5. You are the chief financial officer for a firm that sells gaming consoles. Your firm has the following average-total-cost schedule:

Quantity	Average Total Cost	TC (ATC · Q)
600 consoles	\$300	\$ 180K
601	301	\$ 180,901

Your current level of production is 600 consoles, all of which have been sold. Someone calls, desperate to buy one of your consoles. The caller offers you \$550 for it. Should you accept the offer? Why or why not?

4. a) At the addition of the first 3 workers, the marginal products are increasing. After the 4<sup>th</sup> worker, the marginal products are decreasing.

• law of diminishing marginal returns:

company hires more workers = output increases (due to specialization of the workers). However, the marginal products or additional output will decrease because of "fixed resources".

c) Average total cost decreases until it reaches the minimum of \$5 (quantity of 140 brooms). Later on, it will increase.

d) The marginal cost decreases until it reaches the minimum of \$2.5 (quantity of 90 brooms). Later on, it will start to increase and then intersect ATC after minimum of \$5.

5. The total cost for producing the 601<sup>st</sup> console = \$180,901  
- 1 more console costs \$901 & the caller only offers \$550 for it.

Therefore, the offering should not be accepted.