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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:

1 w = $100
fixed cost = 200

$ATC = \frac{TC}{Q}$

$MC = \frac{\Delta TC}{\Delta Q}$

Workers	Output	Marginal Product	Total Cost	Average Total Cost	Marginal Cost
0	0	0	200	___	0
	20	___	100		___
1	20	20	300	15	5
	30	___	100		___
2	50	30	400	8	10/3 = 3.33
	40	___	100		___
3	90	40	500	50/9 ≈ 5.56	5/2 = 2.5
	30	___	100		___
4	120	30	600	5	100/30 = 3.33
	20	___	100		___
5	140	20	700	5	5
	10	___	100		___
6	150	10	800	16/3 ≈ 5.33	10
	5	___	100		___
7	155	5	900	180/31 ≈ 5.81	20

a. Fill in the column of marginal products. What pattern do you see? How might you explain it?

b. 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.

c. Fill in the column for average total cost. (Recall that $ATC = TC/Q$.) What pattern do you see?

d. 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
600 consoles	$300
601	301

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?

a. Fill in the column of marginal products. What pattern do you see? How might you explain it?

b. 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.

c. Fill in the column for average total cost. (Recall that $ATC = TC/Q$.) What pattern do you see?

d. Now fill in the column for marginal cost. (Recall that $MC = \Delta TC/\Delta Q$.) What pattern do you see?

a) According to the marginal products, it has the maximum at 3 unit of worker as it increases. Then, after the 3 unit of worker, it started to decrease. It can be explained in the law of variable proportion

b)

c) ATC decreases from 1 worker to 5, then after it starts to increase.

d) MC decreases from 20 units of output to 90 units of output, the after 90 unit, it increases.

1 W = $100

fixed cost = 200

$ATC = \frac{TC}{Q}$

$MC = \frac{\Delta TC}{\Delta Q}$

Workers	Output	Marginal Product	Total Cost	Average Total Cost	Marginal Cost
0	0	0	200	—	0
	20	—	100		—
1	20	20	300	15	5
	30	—	100		—
2	50	30	400	8	$\frac{10}{3} = 3.33$
	90	—	100		—
3	90	40	500	$\frac{50}{9} \approx 5.56$	$\frac{5}{2} = 2.5$
	30	—	100		—
4	120	30	600	5	$\frac{100}{30} = 3.33$
	20	—	100		—
5	140	20	700	5	5
	10	—	100		—
6	150	10	800	$\frac{25}{3} \approx 5.33$	10
	3	—	100		—
7	155	5	900	$\frac{180}{37} \approx 3.81$	20

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
600 consoles	$300
601	301

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?

600 consoles → 600 x 300 = 180,000

601 consoles → 601 x 301 = 180,901

180,000 − 180,901 = $901 → cost to produce

If you accept the offer, you will lose the profit as the cost of another additional is higher than the offer ($550)