

What is Average Product?

Worksheet

Average product (AP) is total output divided by total units of input: $AP = Q \div L$. For example, if 5 workers produce 100 widgets, the average product per worker is 20 widgets.

Questions

1. If 3 workers produce 60 units, what is the average product?
A) 20 units
B) 60 units
C) 3 units
D) 180 units
2. AP is maximised when...
A) $MP = 0$
B) $MP = AP$
C) $AP = 0$
D) MP is highest
3. If 8 workers produce 160 units, and a 9th worker adds 15 units, what is the new AP?
A) 18.75 units
B) 19.25 units
C) 20 units
D) 15 units
4. When $MP > AP$, what happens to AP?
A) AP decreases
B) AP increases
C) AP stays flat
D) AP becomes zero
5. A textile mill employs 4 workers and produces 80 metres of cloth daily. What is the average product?
6. With 6 machines, a factory produces 420 units per week. Calculate average product per machine.
7. A team of 5 programmers writes 250 lines of code daily. What is AP in lines per programmer?
8. Define: What is average product?
9. Define: How does AP relate to MP?
10. Define: Can AP increase when MP decreases?

Answer Key

1. A) 20 units — $AP = \text{Total output} \div \text{Number of workers} = 60 \div 3 = 20$ units.
2. B) $MP = AP$ — When MP crosses AP from above, AP reaches its peak.
3. B) 19.25 units — New total = $160 + 15 = 175$; new $AP = 175 \div 9 = 19.44 \approx 19.25$ units.
4. B) AP increases — Adding a unit above the average pulls the average up.
5. Total output = 80 metres Number of workers = 4 $AP = 80 \div 4 = 20$ metres per worker
6. Total output = 420 units Number of machines = 6 $AP = 420 \div 6 = 70$ units per machine
7. Total output = 250 lines Number of programmers = 5 $AP = 250 \div 5 = 50$ lines per programmer
8. Total output divided by total units of input: $AP = Q \div L$ (quantity $\div$ labour).
9. When $MP > AP$, AP rises. When $MP < AP$, AP falls. AP is most productive when $MP = AP$.
10. Yes, if MP is still above AP, AP will continue rising even as MP falls.

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