

Percentage profit and loss

1) The length and the breadth of the rectangle are increase by 15% and 20% respectively. What is the percentage increase in the area of rectangle?

- a) 38%
- b) 42%
- c) 46%
- d) 50%

$$\begin{aligned} & \text{Length} \rightarrow L+15\% = L+\frac{15L}{100} = \frac{115L}{100} \\ & \text{Breadth} \rightarrow B+20\% = B+\frac{20B}{100} = \frac{120B}{100} \\ & \text{Area} \rightarrow \frac{115L}{100} \times \frac{120B}{100} = \frac{138LB}{100} \\ & \text{Increase} = \frac{138-100}{100} \times 100 = 38\% \end{aligned}$$

2) The length and the breadth of rectangle are increase by 12% and x% respectively, thereby area of rectangle increase by 40%.

What is the value of x?

- a) 25
- b) 28
- c) 31
- d) 34

$$\begin{aligned} & \text{Length} \rightarrow L+12\% = L+\frac{12L}{100} = \frac{112L}{100} \\ & \text{Breadth} \rightarrow B+x\% = B+\frac{x B}{100} = \frac{(100+x)B}{100} \\ & \text{Area} \rightarrow \frac{112L}{100} \times \frac{(100+x)B}{100} = \frac{112(100+x)LB}{10000} \\ & \text{Increase} = 40\% \Rightarrow \frac{112(100+x) - 10000}{10000} = 40 \\ & 112(100+x) = 14000 \\ & 100+x = \frac{14000}{112} = 125 \\ & x = 25 \end{aligned}$$

3) A sugar trader declares that he sells sugar at the cost price.

However, he uses a weight of 450g instead of 500g. His percentage profit is:

- a) 10%
- b) $11\frac{1}{9}\%$
- c) $12\frac{2}{9}\%$
- d) 12%

$$\begin{aligned} & \text{Cost Price (CP)} = \text{Rs } 100 \\ & \text{Selling Price (SP)} = \text{Rs } 100 \times \frac{450}{500} = \text{Rs } 90 \\ & \text{Profit} = \text{SP} - \text{CP} = 100 - 90 = \text{Rs } 10 \\ & \text{Percentage Profit} = \frac{10}{90} \times 100 = 11\frac{1}{9}\% \end{aligned}$$

4) The difference between CP and SP of a table fan is Rs 175 where it gives the profit of 14%. What is SP of that fan (in Rs.)?

- a) 1225
- b) 1450
- c) 1425
- d) 1275

$$\begin{aligned} & \text{CP} = x \\ & \text{SP} = x + 175 \\ & \text{Profit} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 = 14\% \\ & 14 = \frac{175}{x} \times 100 \\ & 0.14x = 175 \\ & x = \frac{175}{0.14} = 1250 \\ & \text{SP} = 1250 + 175 = 1425 \end{aligned}$$

5) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

- a) 15
b) 16
c) 18
d) 25
- Handwritten solution:
 $CP \rightarrow 1 = 1$
 $CP \rightarrow 20 = 20$
 25%
 $SP = 25$
 $x = \frac{25}{1.25} = 20$
 $x \times 1.25 = 20$
 $x = \frac{20}{1.25}$
16

6) Marked price of the article is Rs.100. It sold with first discount of 10% and second discount was half of the previous discount then find the selling price after the two successive discounts.

- a) Rs.87.5
b) Rs.90
c) Rs.85.5
d) Rs.85
- Handwritten solution:
 $x = 100 \downarrow 10\% = 90$
 $90 \downarrow 5\% = 85.5$
85.5

7) An article was sold at a profit of 20%. If both the cost price and selling price decreases by Rs.3000, then the profit would be 25%. Find the original cost price.

- a) Rs. 15000
b) Rs. 30000
c) Rs. 45000
d) Rs. 60000
- Handwritten solution:
 $x \uparrow 20 = CP$
 $SP = 1.2x$
 $CP = x - 3000$
 $SP = 1.2x - 3000$
 $1.2x - 3000 = 1.25(x - 3000)$
 $1.2x - 3000 = 1.25x - 3750$
 $1.2x - 1.25x = -3750 + 3000$
 $-0.05x = -750$
 $x = \frac{750}{0.05} = 15000$
15000

8) The loss incurred by selling 16m of a cloth equals the selling price of 4m of that cloth. Find the loss percentage.

- a) 15%
b) 20%
c) 33.33%
d) 25%
- Handwritten solution:
 $CP/m = 1$
 $CP/16 = 16$
 $loss \rightarrow 4 = 12$
 $\frac{1}{16} \times 100 = 6.25$
 $\frac{1}{16} \times 100 = 6.25$
25%

9) A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?

- a) 3
b) 4
c) 5
- Handwritten solution:
 $CP + 20\%$
 $\frac{1}{6} \times 1.2$
 $\frac{1.2}{6} = 0.2$
 $\frac{1}{0.2} = 5$
5

d) 6

10) A trader mixes 25% kerosene to his petrol and then he sells the whole mixture at the price of petrol. If the cost price of kerosene be 50% of the cost price of petrol, what is the net profit percent?

a) $11\frac{1}{9}\%$

b) $12\frac{2}{9}\%$

c) $9\frac{1}{11}\%$

d) 20%

11) A shopkeeper sells his goods at the same price as what he pays his supplier. But when he buys from his supplier, he takes 10% more than the indicated weight and when he sells to his customers he gives 10% less than the indicated weight. Find his profit percentage.

a) $18\frac{2}{11}\%$

b) $22\frac{2}{9}\%$

c) $20\frac{2}{9}\%$

d) 20%

Handwritten solution for Question 10:

$$\begin{aligned} &1 \text{ lit } P = 200 \\ &1 \text{ lit } K = 100 \\ &\text{CP } 1.25 = 200 + 25 = 225 \\ &\text{SP } 1.25 = 200 + 50 = 250 \\ &\frac{25}{225} \times 100 = 11\frac{1}{9}\% \end{aligned}$$

Handwritten solution for Question 11:

$$\begin{aligned} &x = 100 \rightarrow 110 \\ &\downarrow 10\% \\ &90 \\ &\left(\frac{100}{90} \times \frac{110}{100} - 1 \right) \times 100 \\ &= \left(\frac{110}{90} - 1 \right) \times 100 \\ &= \frac{20}{90} \times 100 \\ &= 22\frac{2}{9}\% \end{aligned}$$