



# *PROFIT & LOSS*



Cost Price:

The price, at which an article is purchased, is called its cost price, abbreviated as C.P.

Selling Price:

The price, at which an article is sold, is called its selling prices, abbreviated as S.P.

Profit or Gain:

If S.P. is greater than C.P., the seller is said to have a profit or gain.

Loss:

If S.P. is less than C.P., the seller is said to have incurred a loss.

## IMPORTANT FORMULAE

1.  $\text{Gain} = (\text{S.P.}) - (\text{C.P.})$

2.  $\text{Loss} = (\text{C.P.}) - (\text{S.P.})$

3. Loss or gain is always reckoned on C.P.

4. Gain Percentage: (Gain %)

$$\text{Gain \%} = \left( \frac{\text{Gain} \times 100}{\text{C.P.}} \right)$$

5. Loss Percentage: (Loss %)

$$\text{Loss \%} = \left( \frac{\text{Loss} \times 100}{\text{C.P.}} \right)$$

6. Selling Price: (S.P.)

$$SP = \left[ \frac{(100 + \text{Gain \%})}{100} \times C.P \right]$$

7. Selling Price: (S.P.)

$$SP = \left[ \frac{(100 - \text{Loss \%})}{100} \times C.P. \right]$$

8. Cost Price: (C.P.)

$$C.P. = \left[ \frac{100}{(100 + \text{Gain \%})} \times S.P. \right]$$

9. Cost Price: (C.P.)

$$C.P. = \left[ \frac{100}{(100 - \text{Loss \%})} \times S.P. \right]$$

10. If an article is sold at a gain of say 35%, then S.P. = 135% of C.P.

11. If an article is sold at a loss of say, 35% then S.P. = 65% of C.P.

12. When a person sells two similar items, one at a gain of say  $x$  %, and the other at a loss of  $x$  %, then the seller always incurs a loss given by:

$$\text{Loss \%} = \left( \frac{\text{Common Loss and Gain \%}}{10} \right)^2 = \left( \frac{x}{10} \right)^2.$$

13. If a trader professes to sell his goods at cost price, but uses false weights, then

$$\text{Gain \%} = \left[ \frac{\text{Error}}{(\text{True Value}) - (\text{Error})} \times 100 \right] \%.$$

**Mohan purchased a car in Rs. 250000 and sold in Rs. 348000. What is the percentage of profit in car?**

Cost Price (C.P.) of the car bought by Mohan = Rs. 250000

Also, The Selling Price of the car = Rs. 348000

So, Profit = Selling Price – Cost Price

$$\Rightarrow \text{Profit} = 348000 - 250000$$

$$\Rightarrow \text{Profit} = \text{Rs. } 98000$$

Now,

$$\text{Profit Percentage} = (\text{Profit/C.P.}) \times 100$$

$$\Rightarrow \text{Profit percentage} = 98000/250000 \times 100$$

$$\Rightarrow \text{Profit percentage} = 0.392 \times 100$$

$$\Rightarrow \text{Profit Percentage} = 39.2\%$$

**$\therefore$  The profit percentage made by selling the car = 39.2%**



**If C.P. is Rs. 2516 and S.P. is Rs. 2272, find the percentage loss.**

To find the loss percentage, you can use the formula:

$$\text{Loss \%} = (\text{Loss} / \text{Cost Price}) \times 100$$

First, calculate the loss:

$$\text{Loss} = \text{Cost Price} - \text{Selling Price} = 2516 - 2272 = 244$$

Now, plug the loss into the formula:

$$\text{Loss Percentage} = (244 / 2516) \times 100 \approx 9.7\%$$

So, the loss percentage is approximately **9.7%**.

**CP = Rs. 56.25, Gain % = 20%, Find Selling Price.**

$$SP = \frac{100 + \text{gain}\%}{100} \times CP = \frac{100 + 20}{100} \times 56.25 = 67.5$$

**CP = 80.40, Loss = 15%, SP = ?**

$$SP = \frac{100 - \text{Loss}\%}{100} \times CP = \frac{100 - 15}{100} \times 80.40 = 68.34$$



**A gold bracelet is sold for Rs. 14,500 at a loss of 20%. What is the cost price of the gold bracelet?**

A gold bracelet is sold for Rs. 14,500 at a loss

$$(a) \text{ Cost price of bracelet} = \frac{\text{selling price} \times 100}{100 - \text{Loss}\%}$$

$$\therefore \text{Cost Price of bracelet} = \frac{14500 \times 100}{80} = ₹ 18125$$

**Shalu sold a mobile phone at the cost of Rs1950 at the loss of 25%. At what cost will she have to sell it to get a profit of 30%.**

$$SP = 1950, Loss = 25\% \quad CP = \frac{100}{100 - 25} \times 1950 = \frac{100}{75} \times 1950 = 2600$$

$$\text{If } CP = 2600, Profit = 30\%, \text{ then } SP = \frac{100 + profit\%}{100} \times CP = \frac{100 + 30}{100} \times 2600 = \frac{130}{100} \times 2600 = 3380$$

**A book was sold for Rs. 27.50 with a profit of 10%. If it was sold for Rs. 25.75 then what would have been the percentage of profit or loss?**

$$\text{C.P} = (100/110) \times 27.50 = \text{Rs. } 25$$

According to the question:

$$\text{If S.P} = \text{Rs. } 25.75$$

$$\text{Profit} = 25.75 - 25 = \text{Rs. } 0.75$$

$$\Rightarrow \text{Profit\%} = 0.75/25 \times 100 = 3\%$$

**$\therefore$  The percentage of profit is 3%.**

**If the cost price is 96% of the selling price, then what is the profit percent?**

Let the Selling Price is  $100x$ .

Then the Cost price = 96% of  $100x = 96x$

**Formula Used:**

Profit = S.P. - C.P.

Profit % = Profit/C.P.  $\times 100$

**Calculations:**

$\Rightarrow$  Profit =  $100x - 96x = 4x$

$\Rightarrow$  Profit % =  $(4x/96x) \times 100$

$\Rightarrow$  Profit % = 4.17%

$\therefore$  The profit percent is 4.17%.

**The selling price of 30 fans is equal to the purchase price of 25 fans. What is the profit or loss in percentage?**

The cost price (CP) of 1 fan is  $x$ .

So, the cost price of 25 fans =  $25x$ .

And the selling price (SP) of 30 fans = the cost price of 25 fans =  $25x$ .

Therefore, the loss on 30 fans = CP of 30 fans - SP of 30 fans

$$\Rightarrow 30x - 25x = 5x.$$

The loss percentage = Loss Percentage =  $(\text{Loss} / \text{Cost Price}) \times 100$

$$\Rightarrow (5x/30x) \times 100 = 16.67\% = 16\frac{2}{3}\%$$

**So, there is a loss of  $16\frac{2}{3}\%$  on the sale of 30 fans.**

**A man sold 2 flats for Rs 675958 each. On one he gains 16% while on the other he losses 16%. How much does he gain/loss in the whole transaction?**

There will be loss in the whole transaction.

$$Loss \% = \frac{gain\% \times Loss\%}{100} = \frac{16 \times 16}{100} = 2.56\%$$

**If the manufacturer gains 10%, the wholesale dealer gains 15% and the retailer gains 25%, then find the cost of production of a table, if the retail price was Rs.1265.**

Let cost price of a table be Rs.  $x$

According to the question

$$x \times 110/100 \times 115/100 \times 125/100 = 1265$$

$$\Rightarrow x \times 11/10 \times 23/20 \times 5/4 = 1265$$

$$\Rightarrow x = 1265 \times 10/11 \times 20/23 \times 4/5$$

$$\Rightarrow x = \text{Rs. } 800$$

$\therefore$  Cost of production of the table is Rs. 800.



Monika purchased a pressure cooker at  $\frac{9}{10}\%$  of its selling price and sold it at 8% more than its SP. Find her gain percent.

Let S.P be Rs.  $x$

Then, C.P = Rs.  $\frac{9x}{10}$

Now, S.P = 108% of Rs.  $x$  = Rs.  $\frac{27x}{25}$

$$\begin{aligned}\text{Gain} &= \frac{27x}{25} - \frac{9x}{10} \\ &= \frac{108x - 90x}{100} = \frac{18x}{100}\end{aligned}$$

$$\begin{aligned}\text{gain percentage} &= \frac{\text{Gain}}{\text{CP}} \times 100\% \\ &= \frac{18x}{100} \times \frac{10}{9x} \times 100\% = 20\%\end{aligned}$$

**A man bought a horse and a carriage for ₹ 3000. He sold the horse at a gain of 20% and the carriage at a loss 10%, thereby gaining 2% on the whole. Find the cost of the horse.**

Let the C.P of horse = ₹ $x$

Then the C.P of carriage = ₹ (3000- $x$ )

20% of  $x$  - 10% of (3000 - $x$ ) = 2% of 3000

$$\Rightarrow \frac{x}{5} - \frac{(3000 - x)}{10} = 60$$

$$\Rightarrow 2x - 3000 + x = 600$$

$$\Rightarrow 3x = 3600 \Rightarrow x = ₹1200$$