

PROFIT AND LOSS

Cost Price

The price at which an article is purchased is called the cost price or CP.

Selling Price

The price at which an article is sold is called the selling price or SP.

Formulae

$$\text{Gain or Profit} = \text{SP} - \text{CP}$$

$$\text{Gain per cent or Profit per cent} = \left(\frac{\text{Gain}}{\text{CP}} \times 100 \right) \text{ or } \left(\frac{\text{Profit}}{\text{CP}} \times 100 \right)$$

$$\text{SP} = \left(\frac{100 + \text{Profit \%}}{100} \right) \times \text{CP}$$

Similarly,

$$\text{Loss} = \text{CP} - \text{SP}$$

$$\text{Loss per cent} = \left(\frac{\text{Loss}}{\text{CP}} \times 100 \right); \text{SP} = \frac{(100 - \text{Loss \%})}{100} \times \text{CP}$$

- The Profit and Loss per cent is always calculated on the cost price.
- If a trader professes to sell his goods at CP but uses false weight, then Gain per cent or Profit per cent

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

Marked Price or List Price

Price that is indicated or marked on the article is called marked price or MP.

Discount

It is reduction given on the Marked Price or List Price of an article.

$$d \text{ per cent} = \frac{100 \times \text{discount}}{\text{MP}}; \text{Selling Price} = \frac{(100 - d\%)}{100} \times \text{MP}$$

If a trade gets $x\%$ profit and $x\%$ loss in selling two different articles, then in over all transaction, there is always a loss which is given by

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

Example 1: A chair is bought for ₹ 1950 and sold at ₹ 2340. Find the gain per cent.

Solution. CP = ₹ 1950 and SP = ₹ 2340

$$\text{Gain} = ₹ (2340 - 1950) = ₹ 390$$

$$\text{Gain \%} = \left(\frac{390}{1950} \times 100 \right) \% = 20\%$$

Example 2: A radio is bought for ₹ 780 and sold at ₹ 650. Find the loss per cent.

Solution. CP = ₹ 780 and Sp = ₹ 650

$$\text{Loss} = \text{CP} - \text{SP} = ₹ (780 - 650) = ₹ 130$$

$$\text{Loss \%} = \left(\frac{130}{780} \times 100 \right) = 16\frac{2}{3}\%$$

Example 3: A book is bought for ₹ 80 and sold at the gain of 5%. Find the selling price.

Solution. CP = ₹ 80, Gain = 5%

$$\text{SP} = 105\% \text{ of } ₹ 80 = ₹ \left(\frac{105}{100} \times 80 \right) = ₹ 84$$

Example 4: If cost price of 15 articles is equal to the selling price of 12 articles, then find the gain per cent.

Solution. Let cost price of each article = ₹ 1

Then, Cost price of 15 articles = ₹ 15

∴ Selling price of 12 articles = ₹ 15

But Cost price of 12 articles = ₹ 12

∴ Profit = ₹ (15 - 12) = ₹ 3

∴ Profit % = $\frac{3}{12} \times 100 = 25\%$

Example 5: What is the equivalent discount of three consecutive discount 30%, 20% and 5%.

Solution. Let MP = ₹ 100

$$\therefore \text{SP} = 95\% \text{ of } 80\% \text{ of } 70\% \text{ of } 100 = \frac{95}{100} \times \frac{80}{100} \times \frac{70}{100} \times 100 = ₹ 53.20$$

$$\therefore \text{Required equivalent discount} = ₹ (100 - 53.20) = ₹ 46.80$$

Example 6: By selling 66 m of cloth a person gains the cost price of 22 m. Find the gain per cent.

Solution. Let CP of 1 m cloth = ₹ 1

$$\text{Then, Gain \%} = \frac{\text{gain}}{\text{CP}} \times 100 = \frac{\text{CP of 22 m cloth}}{\text{CP of 66 m cloth}} \times 100 = \frac{22}{66} \times 100 = 33\frac{1}{3}\%$$

Example 7: A radio is listed at ₹ 500 with a discount of 10%. What additional discount must be offered to the customer to bring the net price to ₹ 423?

Solution. List price = ₹ 500, Discount = 10%

$$\text{SP} = 90\% \text{ of } ₹ 500 = ₹ \left(\frac{90}{100} \times 500 \right) = ₹ 450$$

$$\text{Sale price} = ₹ 423$$

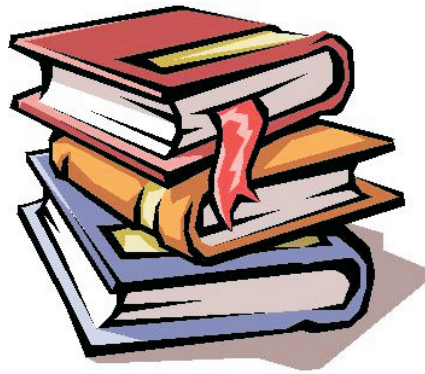
$$\text{Additional discount} = \left(\frac{27}{450} \times 100 \right) = 6\%$$

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