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Chapter 11: Profit, Loss and Discount

Topic-wise short notes with solved examples

Cost price, selling price, profit and loss percentages, marked price and discount, with the shortcuts for successive discounts.

1 Cost price, selling price and profit

- **Cost price (CP)** is what the seller pays. **Selling price (SP)** is what the buyer pays.
- If $SP > CP$ there is a **profit**: $\text{profit} = SP - CP$.
- If $SP < CP$ there is a **loss**: $\text{loss} = CP - SP$.
- **Profit percent and loss percent are always calculated on the cost price.**

$$\text{profit}\% = \frac{\text{profit}}{CP} \times 100 \quad \text{loss}\% = \frac{\text{loss}}{CP} \times 100$$

- To find SP from CP: $SP = CP \times \left(1 + \frac{\text{profit}\%}{100}\right)$ for a profit, or $CP \times \left(1 - \frac{\text{loss}\%}{100}\right)$ for a loss.

Example 1.1 A shopkeeper buys a watch for Rs 250 and sells it for Rs 300. Find the profit percent.

SOLUTION

$$\text{Profit} = 300 - 250 = 50. \text{ Profit percent} = \frac{50}{250} \times 100.$$

20%

Example 1.2 A bicycle bought for Rs 400 is sold for Rs 340. Find the loss percent.

SOLUTION

$$\text{Loss} = 400 - 340 = 60. \text{ Loss percent} = \frac{60}{400} \times 100.$$

15%

Example 1.3 Find the selling price needed to gain 20% on an article that costs Rs 450.

SOLUTION

$$SP = 450 \times 1.2.$$

Rs 540

2 Finding the cost price from the selling price

- If you know the SP and the profit or loss percent, divide: $CP = \frac{SP}{1 \pm \text{percent}/100}$.

Example 2.1 An article is sold at a 10% profit for Rs 1320. Find its cost price.

SOLUTION

$$CP = \frac{1320}{1.1}.$$

Rs 1200

Example 2.2 An article is sold at a 20% loss for Rs 720. Find its cost price.

SOLUTION

$$CP = \frac{720}{0.8}.$$

Rs 900

3 Marked price and discount

- The **marked price (MP)** is the price written on the article. A **discount** is a reduction in the marked price.
- $\text{discount} = MP - SP$, and $\text{discount}\% = \frac{\text{discount}}{MP} \times 100$. **Discount is calculated on the marked price.**
- Two discounts of $a\%$ and $b\%$ given one after the other are equal to **one** discount of $\left(a + b - \frac{ab}{100}\right)\%$.

Example 3.1 A table marked at Rs 800 is sold at a discount of 15%. Find the selling price.

SOLUTION

$$\text{Discount} = 0.15 \times 800 = 120.$$

Rs 680

Example 3.2 Find the single discount equal to two successive discounts of 20% and 10%.

SOLUTION

Factors: $0.8 \times 0.9 = 0.72$. So the buyer pays 72% of the marked price.

28%

Example 3.3 An article costs Rs 500. The shopkeeper marks it 40% above the cost and gives a 10% discount. Find the profit percent.

SOLUTION

$$MP = 500 \times 1.4 = 700. SP = 700 \times 0.9 = 630.$$

$$\text{Profit} = 130, \text{ and } \frac{130}{500} \times 100 = 26.$$

26%

REMEMBER

Profit and loss use the cost price as the base. Discount uses the marked price as the base. Mixing them up is the most common mistake.

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