PROFIT AND LOSS

Profit and Loss Formula

Profit and loss formulas are used to calculate the profit or loss that has been incurred by selling a particular product. They are mainly used in business and financial transactions to depict how much profit or loss a trader has incurred from any particular deal.

What is the Profit and Loss Formula?

Profit and loss are the terms used to identify whether a transaction is profitable or not. Before moving on to the profit and loss formula, we need to understand the terms 'selling price' and 'cost price'. The price at which a product is purchased is called its cost price. The price at which a product is sold is called its selling price. Now, if the selling price is greater than the cost price, then the difference between them is called profit. If the selling price is less than the cost price, then the difference between them is called loss.

Profit Loss Formula

When the selling price and cost price are known, the basic formula for calculating the profit is:

Profit = Selling price (S.P.) - Cost price (C.P.)

When the selling price and cost price are known, the basic formula for calculating the loss is:

Loss = Cost price (C.P.) - Selling price (S.P.)

Profit Loss Formula

Profit = Selling price – Cost price

Profit = S.P. – C.P.

Loss = Cost price – Selling price

Loss = C.P. – S.P.

Formula for Profit and Loss Percentage

In some cases, after the profit or loss is calculated, it is converted in the form of a percentage. It is used to express the amount of profit or loss incurred in the form of a percentage. This helps in comparing two quantities. The formulas for profit and loss percentage are given below:

- Profit percentage(P%) = (Profit /Cost Price) × 100
- Loss percentage(L%) = (Loss / Cost price) × 100
- S.P. = {(100 + P%)/100} × CP(if SP > CP)
- S.P. = {(100 – L%)/100} × CP(if SP < CP)
- C.P. = {100/(100 + P%)} × SP(if SP > CP)
- C.P. = {100/(100 – L%)} × SP(if SP < CP)

$$\text{Profit} = \text{selling price} - \text{cost price}$$

$$\text{Percentage Profit (\%)} = \frac{\text{profit}}{\text{cost price}} \times 100$$

$$\text{Loss} = \text{cost price} - \text{selling price}$$

$$\text{Percentage Loss (\%)} = \frac{\text{loss}}{\text{cost price}} \times 100$$

EXERCISE 4.2

Fill in the blanks:

(i) Loss or gain percentage is always calculated on the _____ .

Answer: Cost Price

(ii) A mobile phone is sold for Rs. 8400 at a gain of 20%.

The cost price of the mobile phone is _____.

Answer: Rs. 7000

Hint:

Let cost price of mobile be Rs. x

Given that selling price is Rs. 8400 and gain is 20%

As per formula,

$$SP = \frac{(100+\text{gain}\%)}{100} \times CP$$

$\therefore$ by substituting we get,

$$8400 = \frac{(100+20)}{100} \times x$$

$$8400 = \frac{120}{100} x$$

$$x = \frac{8400 \times 100}{120} = ₹\ 7000$$

(iii) An article is sold for Rs. 555 at a loss of $7\frac{1}{2}\%$. The cost price of the article is

Answer:Rs. 600

Hint:

Given selling price is Rs. 555 & loss $7\frac{1}{2}\%$. as **per formula**

$$SP = \frac{(100-\text{loss}\%)}{100} \times CP$$

by substituting, we get

$$555 = \frac{\left(100-7\frac{1}{2}\right)}{100} \times CP$$

$$\therefore 555 = \frac{100-\frac{15}{2}}{100} \times CP = \frac{\frac{200-15}{2}}{100} \times CP$$

$$555 = \frac{\frac{185}{2}}{100} \times CP$$

$$\therefore CP = \frac{555 \times 100}{\frac{185}{2}} = \frac{555 \times 100}{185} \times 2 = ₹\ 600$$

(iv) A mixer grinder marked at Rs. 4500 is sold for Rs. 4140 after discount.

The rate of discount is _____ .

Answer:8 %

Hint:

Marked price is Rs. 4500

Discounted price in Rs. 4140

∴ Discount = Marked price – Discounted priòe
= 4500 – 4140 = 360

$$\therefore \text{Rate of discount} = \frac{\text{Discount}}{\text{Marked Price}} \times 100$$
$$= \frac{360}{4500} \times 100 = 8\%$$

(v) The total bill amount of a shirt costing Rs. 575 and a T-shirt costing Rs. 325 with GST of 5% is _____ .
Answer:
Cost of price shirt = Rs. 575 (CP)
GST = 5%

$$\text{Bill amount formula} = CP \times \left(\frac{100 + GST\%}{100}\right)$$
$$= 575 \times \left(\frac{100+5}{100}\right) = 575 \times \frac{105}{100} = ₹\ 603.75$$

Cost of price shirt = Rs. 325 (CP)
GST = 5%

$$\text{Bill amount} = CP \times \left(\frac{100 + GST\%}{100}\right)$$
$$= 325 \times \left(\frac{100+5}{100}\right) = ₹\ 341.25$$

∴ Total bill amount = Rs. 603.75 + Rs. 341.25 = Rs. 945

Question 2.
If selling an article for Rs. 820 causes 10% loss on the selling price, then find its cost price.
Answer:
Given that selling price (SP) = Rs. 820
Loss % = 10 %

$$\text{As per formula SP} = CP \times \frac{(100 - \text{loss}\%)}{100}$$

$\therefore$ Substituting in formula, we get

$$820 = CP \times \left(\frac{100-10}{100}\right)$$

$$\therefore CP = \frac{82\cancel{0} \times 100}{9\cancel{0}} = 911$$

Question 3.

If the profit earned on selling an article for Rs. 810 is the same as loss on selling it for Rs. 530, then find the cost price of the article.

Answer:

Case 1: Profit = Selling price (SP) – Cost price (CP)

Case 2: Loss = Cost price (CP) – Selling price (SP)

Given that profit of case 1 = loss of case 2

$\therefore$ P = 810 – CP

L = CP – 530

Since profit (P) = loss (L)

810 – CP = CP – 530

$\therefore$ 2CP = 810 + 530 = 1340 $\Rightarrow$ C.P = 1340/2

$\therefore$ CP = Rs. 670

Question 4.

If the selling price of 10 rulers is the same as the cost price of 15 rulers, then find the profit percentage.

Answer:

Let cost price of one ruler be x

Given that selling price (SP) of 10 rulers.

i.e., same as cost price (CP) of 15 rulers

$\therefore$ SP of 10 rulers = 15 × x = 15x

$\therefore$ SP of 1 ruler = 15x/10 = 1.5x

$\therefore$ Gain = SP of 1 ruler – CP of 1 ruler = 1.5x – x = 0.5x

$$\text{Gain \%} = \frac{\text{Gain}}{CP} \times 100 = \frac{0.5\cancel{x}}{\cancel{x}} \times 100 = 50\%$$