Unit 4 Financial Arithmetic

Exercise 4.1

1. Yasir bought a car for Rs. 2,000,000 and sold it for Rs. 2,040,000. Find his profit and profit percentage.

Solution: Given that

Cost price (C.P) of the car = Rs. 2,000,000

Selling price (S.P) of the car = Rs. 2,040,000

Profit = S.P − C.P (S.P > C.P)

Profit = Rs. 2,040,000 − Rs. 2,000,000

= Rs. 40,000

Now, we will calculate his profit percentage. By using formula

$$\text{Profit percentage} = \frac{\text{Profit}}{\text{C.P.}} \times 100\%$$

$$= \frac{4\cancel{0,000}}{2,00\cancel{0,000}} \times 100\%$$

$$= \frac{4}{200} \times 100\%$$

$$= 0.02 \times 100\%$$

$$= 2\%$$

Hence, profit and profit percentage of Yasir are Rs. 40,000 and 2% respectively.

Remember!

Profit = selling price - cost price

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

Loss = cost price - selling price

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

2. Asiya bought a shop for Rs. 2,800,000 and sold it for Rs. 2,400,000. Find her loss and loss percentage.

Solution: Given that

Cost price (C.P) of the shop = Rs. 2,800,000

Selling price (S.P) of the shop = Rs. 2,400,000

Loss = C.P − S.P (S.P < C.P)

Loss = Rs. 2,800,000 − Rs. 2,400,000

= Rs. 400,000

Now, we will calculate his loss percentage. By using formula

$$\text{Loss percentage} = \frac{\text{Loss}}{\text{C.P.}} \times 100\%$$

$$= \frac{4\cancel{00,000}}{2,8\cancel{00,000}} \times 100\%$$

$$= \frac{4}{28} \times 100\%$$

$$= 0.1429 \times 100\%$$

$$= 14.29\%$$

Hence, loss and loss percentage of Asiya are Rs. 400,000 and 14.29% respectively.

3. Asif bought a plot for Rs. 5,000,000 and sold it at 10% profit. Find the selling price of the plot.

Solution: Given that

Cost price (C.P) of the plot = Rs. 5,000,000

Selling price (S.P) of the shop = ?

Profit = 10%
Selling price = C.P + Profit
First, we will calculate the profit

$$\text{Profit} = 10\% \text{ of cost price}$$
$$= \frac{10}{\cancel{100}} \times 5,000,0\cancel{00}$$
$$= 10 \times 50,000$$
$$= 500,000$$

Selling price = C.P + Profit
= Rs. 5,000,000 + Rs. 500,000
= Rs. 5,500,000

Hence, the selling price of the plot is Rs. 5,500,000.

4. Ahmad sold his bike for Rs. 70,000 and got 15% profit. Find the cost price of the bike.

Solution: Given that
Cost price (C.P) of the bike = ?
Selling price (S.P) of the bike = Rs. 70,000
Profit = 15%
C.P = Selling Price − Profit
Suppose that the cost price of bike = Rs. x
First, we will calculate the profit

$$\text{Profit} = 15\% \text{ of cost price}$$
$$= \frac{15}{100} \times \text{Rs.}\, x$$

Divide numerator and denominator by 5

$$= \text{Rs.}\, \frac{3x}{20}$$

So, by using formula

Cost price (C.P) = Selling Price (S.P) − Profit

$$\text{Rs.}\, x = \text{Rs. } 70,000 - \text{Rs.}\, \frac{3x}{20}$$
$$\text{Rs.}\, x + \text{Rs.}\, \frac{3x}{20} = \text{Rs.}\, 70,000$$
$$\text{Rs.}\left(x + \frac{3x}{20} \right) = \text{Rs.}\, 70,000$$
$$\text{Rs.}\left(\frac{23x}{20} \right) = \text{Rs.}\, 70,000$$

Multiply both sides by 20

$$\text{Rs.}\left(\frac{23x}{\cancel{20}} \right) \times \cancel{20} = \text{Rs.}\, 70,000 \times 20$$

Divide both sides by 23

$$\frac{\text{Rs.}\, \cancel{23}x}{\cancel{23}} = \frac{\text{Rs.}\, 1400000}{23}$$
$$x \approx \text{Rs.}\, 60,870$$

Hence, the cost price of Ahmad's bike is Rs. 60,870.

> **Remember!**
> The symbol ≈ shows approximately equal. It means very similar to but not exactly equal due to rounding.

5. **The marked price of a clock is Rs. 10,000. If it is sold at a discount of 15%. Find the net selling price.**

Solution: Given that

Marked price of the clock = Rs. 10,000

Net selling price (S.P) = ?

Discount = 15%

Net selling price = Marked price + Discount

First, we will calculate the discount

$$\text{Discount} = 15\% \text{ of marked price}$$

$$= \frac{15}{\cancel{100}} \times \text{Rs. } 10,0\cancel{00}$$

$$= 15 \times \text{Rs. } 100$$

$$= \text{Rs. } 1,500$$

So, by using formula

Net selling price = Marked price + Discount

Net selling price = Rs. 10,000 + Rs. 1,500

= Rs. 11,500

Hence, the net selling price of the clock is Rs. 11,500.

6. **The marked price of a table is Rs. 18,000. If it is sold at a discount price of Rs. 12,000. Find the discount percentage.**

Solution: Given that

Marked price of the table = Rs. 18,000

Discount price = Rs. 12,000

Discount = Marked price − Discount price

= Rs. 18,000 − Rs. 12,000

= Rs. 6,000

Discount percentage = ?

By using formula

$$\text{Discount} = \frac{\text{Discount}}{\text{Marked price}} \times 100\%$$

$$= \frac{6,\cancel{000}}{18,\cancel{000}} \times 100\%$$

$$= 0.3333 \times 100\%$$

$$= 33.33\%$$

Hence, the discount percentage is 33.33%.

Exercise 4.2

1. **Asiya owns two shops worth Rs. 2,500,000. If the property tax is 1.5%. Calculate the amount of property tax to be paid by Asiya.**

Solution: Given that

Worth of the property = Rs. 2,500,000

Property tax rate = 1.5%

Amount of property tax = ?

By using formula

$$\text{Property tax} = 1.5\% \text{ of Rs. } 2,500,000$$
$$= \frac{1.5}{100} \times \text{Rs. } 2,500,000$$
$$= \frac{15}{\cancel{1000}} \times \text{Rs. } 2,500,\cancel{000}$$
$$= 15 \times \text{Rs. } 2,500$$
$$= \text{Rs. } 37,500$$

Hence, Asiya paid Rs. 37,500 as property tax.

2. **Azra paid Rs. 8,000 property tax for her house. Find the value of her house, where the property tax rate is 1.8%.**

Solution: Given that

Value of the house = ?

Property tax rate = 1.8%

Amount of property tax = Rs. 8,000

Suppose the value of house is Rs. x.

$$\text{Property tax} = 1.8\% \text{ of Rs. } x$$
$$8,000 = \frac{1.8}{100} \times \text{Rs. } x$$
$$8,000 = \frac{18}{1000} \times \text{Rs. } x$$

Multiply both sides by $1,000$

$$8,000 \times 1000 = \cancel{1000} \times \frac{18}{\cancel{1000}} \times \text{Rs. } x$$
$$8,000,000 = 18x$$

Divide both sides by 18

$$\frac{8,000,000}{18} = \frac{\cancel{18}x}{\cancel{18}}$$
$$\text{Rs. } 444444.44 = x$$

Hence, the value of Azra's house is Rs. 444444.44.

3. **Annual income of Shoaib is Rs. 500,000. The income tax rate is 6%. Calculate the income tax which Shoaib has to pay.**

Solution: Given that

Annual income of Shoaib = Rs. 500,000

Income tax rate = 6%

Amount of income tax = ?

By using formula

$$\text{Income tax} = 6\% \text{ of Rs. } 500,000$$
$$= \frac{6}{100} \times \text{Rs. } 500,000$$
$$= \frac{6}{\cancel{100}} \times \text{Rs. } 500,0\cancel{00}$$
$$= 6 \times \text{Rs. } 5,000$$
$$= \text{Rs. } 30,000$$

Hence, Shoaib will pay Rs. 30,000 as income tax.

4. **If Azka's annual income is Rs. 1,300,000 and she has to pay 6% income tax. What is her net income (take home amount) annually?**

Solution: Given that

Annual income of Azka = Rs. 1,300,000

Income tax rate = 6%

Amount of income tax = ?

Net income annually = ?

By using formula

$$\text{Amount of income tax} = 6\% \text{ of Rs. } 1{,}300{,}000$$

$$= \frac{6}{\cancel{100}} \times \text{Rs. } 1{,}300{,}0\cancel{00}$$

$$= 6 \times \text{Rs. } 13{,}000$$

$$= \text{Rs. } 78{,}000$$

Net income annually = Rs. 1,300,000 − Rs. 78,000

= Rs. 1,222,000

Hence, Azka's net income is Rs. 1,222,000.

5. **Shoaib bought a bike for Rs. 68,000 and also paid 17% general sales tax. What will be the amount of tax paid by Shoaib?**

Solution: Given that

Price of the bike = Rs. 68,000

General sales tax rate = 17%

Amount of general sales tax = ?

$$\text{Amount of general sales tax} = 17\% \text{ of Rs. } 68{,}000$$

$$= \frac{17}{\cancel{100}} \times \text{Rs. } 68{,}0\cancel{00}$$

$$= 17 \times \text{Rs. } 680$$

$$= \text{Rs. } 11{,}560$$

Hence, the amount of general sales tax is Rs. 11,560.

6. **Farhan wants to buy a car, the marked price of the car is Rs. 1,600,000. The value-added tax of 15% is imposed on the car. Calculate the total amount Farhan has to pay.**

Solution: Given that

Marked price of the car = Rs. 1,600,000

value-added tax rate = 15%

Amount of value-added tax = ?

$$\text{Amount of value-added tax} = 15\% \text{ of Rs. } 1{,}600{,}000$$

$$= \frac{15}{\cancel{100}} \times \text{Rs. } 1{,}600{,}0\cancel{00}$$

$$= 15 \times \text{Rs. } 16{,}000$$

$$= \text{Rs. } 240{,}000$$

Total amount = Rs. 1,600,000 + Rs. 240,000

= Rs. 1,840,000

Hence, total amount of car is Rs. 1,840,000.

7. **A house was sold for Rs. 12,500,000 by an agent who received a commission of 1.5%. Calculate the commission received by the agent.**

Solution: Given that

Sold price of the house = Rs. 12,500,000

Commission rate = 1.5%

Amount of commission = ?

$$\text{Amount of commission} = 1.5\% \text{ of Rs. } 12,500,000$$
$$= \frac{1.5}{100} \times \text{Rs. } 12,500,000$$
$$= \frac{15}{\cancel{1000}} \times \text{Rs. } 12,500,\cancel{000}$$
$$= 15 \times \text{Rs.} 12,500$$
$$= \text{Rs. } 187,500$$

Hence, the agent's amount of commission is Rs. 187,500.

8. **Yearly savings of Asiya is Rs. 2,200,000. What is the amount of Zakat she has to pay?**

Solution: Given that

Asiya's annual savings = Rs. 2,200,000

Rate of Zakat = 2.5%

Amount of Zakat = ?

$$\text{Amount of Zakat} = 2.5\% \text{ of Rs. } 2,200,000$$
$$= \frac{2.5}{100} \times \text{Rs. } 2,200,000$$
$$= \frac{25}{\cancel{1000}} \times \text{Rs. } 2,200,\cancel{000}$$
$$= 25 \times \text{Rs.} 2,200$$
$$= \text{Rs. } 55,000$$

Hence, the amount of Zakat is Rs. 55,000.

9. **Ahsan pays Rs. 40,000 as Zakat. What is his yearly savings?**

Solution: Given that

Yearly savings = ?

Zakat rate = 2.5%

Amount of Zakat = Rs. 40,000

$$\text{Amount of Zakat} = 2.5\% \text{ of Yearly savings}$$
$$\text{Rs.} 40,000 = \frac{2.5}{100} \times \text{Yearly savings}$$
$$\text{Rs.} 40,000 = \frac{25}{1000} \times \text{Yearly savings}$$
$$\text{Rs.} 40,000 \times 1000 = 25 \times \text{Yearly savings}$$
$$\text{Rs.} 40,000,000 = 25 \times \text{Yearly savings}$$
$$\text{Divide both sides by } 25$$
$$\frac{\text{Rs.} 40,000,000}{25} = \frac{\cancel{25}}{\cancel{25}} \times \text{Yearly savings}$$
$$\text{Rs.} 1,600,000 = \text{Yearly savings}$$

Hence, Ahsan's yearly savings is Rs. 1,600,000.

10. Abdullah sells his cotton harvest for Rs. 3,500,000. How much Ushr should he pay if the land is irrigated by rain water?

Solution: Given that

Amount of cotton harvest = Rs. 3,500,000

Ushr rate for the land irrigated by rain water = 10%

Amount of Ushr = ?

$$\text{Amount of Ushr} = 10\% \text{ of Rs. } 3,500,000$$

$$= \frac{10}{\cancel{100}} \times \text{Rs. } 3,500,0\cancel{00}$$

$$= 10 \times \text{Rs. } 35,000$$

$$= \text{Rs. } 350,000$$

Hence, the amount of Ushr is Rs. 350,000.

11. Abid's farm is irrigated by tube well. If he paid Rs. 7,000 as Ushr on his cotton crop, how much did his crop sell for?

Solution: Given that

Amount of Ushr = Rs. 7,000

Ushr rate for the land irrigated by tube well = 5%

Amount of crop = ?

$$\text{Amount of Ushr} = 5\% \text{ of (Amount of crop)}$$

$$\text{Rs. } 7,000 = \frac{5}{100} \times \text{Amount of crop}$$

$$\text{Rs. } 7,000 \times 100 = 5 \times \text{Amount of crop}$$

Divide both sides by 5

$$\frac{\text{Rs. } 7,000 \times \cancel{100}^{20}}{\cancel{5}} = \frac{\cancel{5}}{\cancel{5}} \times \text{Amount of crop}$$

$$\text{Rs. } 7,000 \times 20 = \text{Amount of crop}$$

$$\text{Rs. } 140,000 = \text{Amount of crop}$$

Hence, Abid sold his crop for Rs. 140,000.

Review Exercise 4

1. Choose the correct option.

(i) Asher bought a chair for Rs. 500 and sold it for Rs. 1,000. His profit percentage is:

(a) 50% (b) 100% (c) 150% (d) 75%

(ii) Marked price of a radio is Rs. 1,000, if it is sold at a discount of 80%, the net selling price is:

(a) Rs. 400 (b) Rs. 200 (c) Rs. 800 (d) Rs. 600

(iii) Asiya owns a shop of worth Rs. 1,000,000, amount of property tax (1%) is:

(a) Rs.50,000 (b) Rs.10,000 (c) Rs.100,000 (d) Rs.7,500

(iv) Ghazala paid Rs. 10,000 as Zakat, what was her year's saving?

(a) Rs.400,000 (b) Rs.4,000 (c) Rs.400 (d) Rs.40,000

(v) Ahsan's farm is irrigated by tube well, if he paid Rs. 10,000 as Ushr, how much did his crop sell for?

(a) Rs. 2,000 (b) Rs. 200,000 (c) Rs. 2,000,000 (d) Rs. 10,000

2. **Abdullah bought a mobile phone for Rs. 25,000 and sold it at 15% profit. Find his profit and sale price.**

Solution: Given that

Cost price (C.P) of the mobile phone = Rs. 25,000

Profit = 15%

Selling price (S.P) of the mobile phone = ?

Profit (in rupees) = ?

Selling price = C.P + Profit

First, we will calculate the profit.

$$\text{Profit} = 15\% \text{ of cost price}$$
$$= \frac{15}{\cancel{100}} \times \text{Rs. } 25,0\cancel{00}$$
$$= 15 \times \text{Rs. } 250$$
$$= \text{Rs. } 3,750$$

$$\text{Selling price} = \text{C.P} + \text{Profit}$$
$$= \text{Rs. } 25,000 + \text{Rs. } 3,750$$
$$= \text{Rs. } 28,750$$

Hence, the profit is Rs. 3,750 and selling price of the mobile phone is Rs. 28,750.

3. **Azka bought a suit in Rs. 3,000 and sold it at 10% loss. Find her loss and sale price.**

Solution: Given that

Cost price (C.P) of the suit = Rs. 3,000

Loss = 10%

Selling price (S.P) of the suit = ?

Loss (in rupees) = ?

Selling price = C.P − Loss

First, we will calculate the loss.

$$\text{Loss} = 10\% \text{ of cost price}$$
$$= \frac{10}{\cancel{100}} \times \text{Rs. } 3,0\cancel{00}$$
$$= 10 \times \text{Rs. } 30$$
$$= \text{Rs. } 300$$

$$\text{Selling price} = \text{C.P} - \text{Loss}$$
$$= \text{Rs. } 3,000 - \text{Rs. } 300$$
$$= \text{Rs. } 2,700$$

Hence, the loss is Rs. 300 and selling price of the suit is Rs. 2,700.

4. **The marked price of a bike is Rs. 15,000. If it is sold at a discount price of Rs. 14,000. Find the discount percentage.**

Solution: Given that

Marked price of the bike = Rs. 15,000

Discount price = Rs. 14,000

Discount percentage = ?

First, we will calculate the discount.

Discount = Marked price – Discount price

= Rs. 15,000 – Rs. 14,000

= Rs. 1,000

By using formula for calculating discount percentage:

$$\text{Discount percentage} = \frac{\text{Discount}}{\text{Marked price}} \times 100\%$$

$$= \frac{1000}{15000} \times 100\%$$

$$= \frac{100\,\cancel{000}}{15\,\cancel{000}}\%$$

$$= 6.67\%$$

Hence, the discount percentage on the bike is 6.67%.

5. Ghazala sold her bracelet for Rs. 60,000 and got 10% profit. Find the cost price of the bracelet.

Solution: Given that

Selling price (S.P) of the bracelet = Rs. 60,000

Cost price (C.P) of the bracelet = ?

Profit = 10%

C.P = Selling Price − Profit

Suppose that the cost price of the bracelet = Rs. x

First, we will calculate the profit.

$$\text{Profit} = 10\% \text{ of cost price}$$

$$= \frac{10}{100} \times \text{Rs.}\, x$$

$$= \frac{\cancel{10}}{\cancel{100}_{10}} \times \text{Rs.}\, x$$

$$= \text{Rs.}\, \frac{x}{10}$$

So, by using formula

Cost price (C.P) = Selling Price (S.P) − Profit

$$\text{Rs.}\, x = \text{Rs.}\ 60,000 - \text{Rs.}\, \frac{x}{10}$$

$$\text{Rs.}\, x + \text{Rs.}\, \frac{x}{10} = \text{Rs.}\, 60,000$$

$$\text{Rs.}\left(x + \frac{x}{10}\right) = \text{Rs.}\, 60,000$$

$$\text{Rs.}\left(\frac{11x}{10}\right) = \text{Rs.}\, 60,000$$

Multiply both sides by 10

$$\text{Rs.}\left(\frac{11x}{\cancel{10}}\right) \times \cancel{10} = \text{Rs.}\, 60,000 \times 10$$

Divide both sides by 11

$$\frac{\text{Rs.}\, \cancel{11}x}{\cancel{11}} = \frac{\text{Rs.}\, 600000}{11}$$

$$x \approx \text{Rs.}\, 54,545$$

Hence, the cost price of the bracelet is Rs. 54,545.

> Remember!
> The symbol ≈ shows approximately equal. It means very similar to but not exactly equal due to rounding.

6. **Fatima owns two shops, she paid Rs. 10,000 property tax for her shops. Find the value of her shops if property tax rate is 2%.**

Solution: Given that

Value of the shops = ?

Property tax rate = 2 %

Amount of property tax = Rs. 10,000

Suppose the value of the shops is Rs. x.

$$\text{Property tax} = 2\% \text{ of Rs. } x$$

$$10,000 = \frac{2}{100} \times \text{Rs. } x$$

$$10,000 = \frac{\cancel{2}}{\cancel{100}_{50}} \times \text{Rs. } x$$

$$10,000 = \frac{1}{50} \times \text{Rs. } x$$

$$\text{Multiply both sides by } 50$$

$$10,000 \times 50 = \cancel{50} \times \frac{1}{\cancel{50}} \times \text{Rs. } x$$

$$10,000 \times 50 = x$$

$$\text{Rs. } 500,000 = x$$

Hence, the value of Fatima's shops is Rs. 500,000.

7. **Wareesha's annual income is Rs. 1,000,000. The income tax rate is 3%. Calculate the income tax.**

Solution: Given that

Annual income of Wareesha = Rs. 1,000,000

Income tax rate = 3%

Amount of income tax = ?

By using formula

$$\text{Income tax} = 3\% \text{ of Rs. } 1,000,000$$

$$= \frac{3}{100} \times \text{Rs. } 1,000,000$$

$$= \frac{3}{\cancel{100}} \times \text{Rs. } 1,000,0\cancel{00}$$

$$= 3 \times \text{Rs. } 10,000$$

$$= \text{Rs. } 30,000$$

Hence, Wareesha paid Rs. 30,000 as income tax.

8. **Azra has yearly savings of Rs. 2,000,000. Calculate the amount of zakat she has to pay.**

Solution: Given that

Azra's yearly saving = Rs. 2,000,000

As we know that, according to Islamic law

Zakat rate = 2.5%

Amount of Zakat = ?

$$\text{Amount of Zakat} = 2.5\% \text{ of Rs. } 2,000,000$$
$$= \frac{2.5}{100} \times \text{Rs. } 2,000,000$$
$$= \frac{\frac{25}{10}}{100} \times \text{Rs. } 2,000,000$$
$$= \frac{25}{10} \times \frac{1}{100} \times \text{Rs. } 2,000,000$$
$$= \frac{25}{1000} \times \text{Rs. } 2,000,000$$
$$= \frac{25}{\cancel{1000}} \times \text{Rs. } 2,000,\cancel{000}$$
$$= 25 \times \text{Rs. } 2,000$$
$$= \text{Rs. } 50,000$$

Hence, the amount of Zakat is Rs. 50,000.

9. **Mohid's farm is irrigated by tube well. If he paid Rs. 10,000 as Ushr on his rice crop, how much did his crop sell for?**

Solution: : Given that

Amount of Ushr = Rs. 10,000

As we know that, according to Islamic laws

Ushr rate for the land irrigated by tube well = 5%

Amount of rice crop = ?

$$\text{Amount of Ushr} = 5\% \text{ of (Amount of rice crop)}$$
$$\text{Rs.}10,000 = \frac{5}{100} \times \text{Amount of rice crop}$$
$$\text{Multiply both sides by } 100$$
$$\text{Rs.}10,000 \times 100 = \cancel{100} \times \frac{5}{\cancel{100}} \times \text{Amount of rice crop}$$
$$\text{Rs.}1,000,000 = 5 \times \text{Amount of crop}$$
$$\text{Divide both sides by } 5$$
$$\frac{\text{Rs.}1,000,000}{5} = \frac{\cancel{5}}{\cancel{5}} \times \text{Amount of crop}$$
$$\text{Rs.}200,000 = \text{Amount of crop}$$

Hence, Mohid's rice crop was sell for Rs. 200,000.