

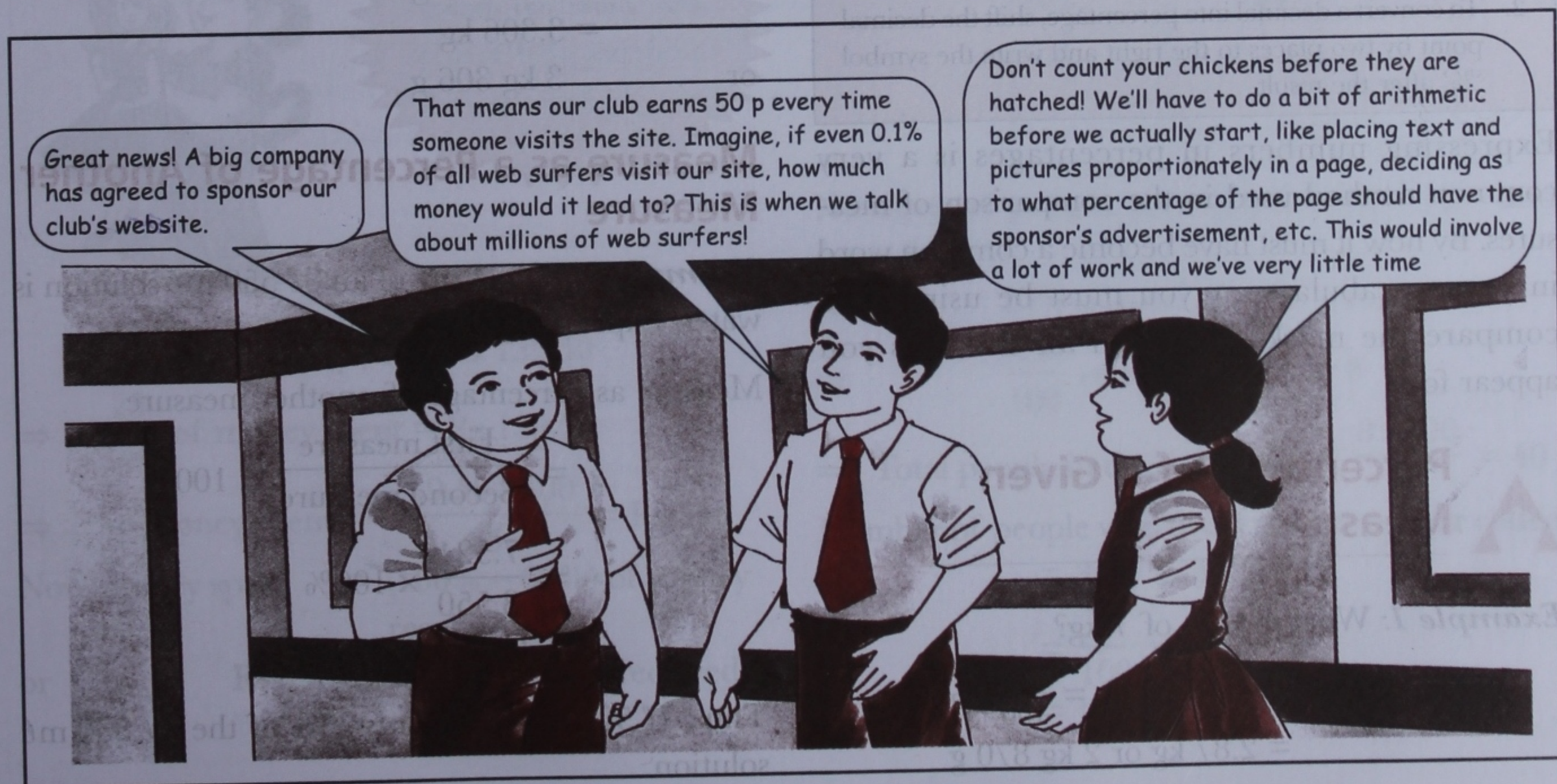
UNIT THREE

- Percentage and its Applications
- Ratio and Proportion
- Speed, Distance and Time
- Time and Work

Commercial Arithmetic

Let's Recap

- Divide the following in the given ratios.
 - Rs 1584 in a 5 : 7 ratio
 - 3 kg 696 g in a 9 : 12 ratio
 - 7 l 896 ml in a 11 : 13 ratio
 - 42 km 107 m in a 20 : 21 ratio
 - 1 h 54 min 8 s in a 15 : 17 ratio
- Find the value of x if the following ratios are in direct proportion.
 - 27 : 189 and 31 : x
 - 41 : 20.5 and x : 32
 - 2.55 : x and 3.6 : 5.04
 - $\frac{5}{18} : \frac{1}{6}$ and $1\frac{1}{4} : x$
- 5 gardeners can weed a garden in 3 days. How long will 3 gardeners take to weed the same garden?
- A man buys a 14" TV for Rs 4176 from an electronics shop advertising a 20% discount. If the marked price of the TV was 45% above its cost price, how much had the shop bought the TV for?





PERCENTAGE AND ITS APPLICATIONS

- Percentage of a Given Measure
- Profit and Loss
- Discount
- Simple Interest
- Compound Interest

Introduction

A fraction is a part of a whole, a decimal is a part of a power of 10, and a per cent is a part of 100.

Common Fraction	Decimal	Per cent	Percentage
$\frac{3}{4}$	0.75	$\frac{75}{100}$	75%
$\frac{12}{25}$	0.48	$\frac{48}{100}$	48%
$1\frac{7}{8}$	1.875	$\frac{187.5}{100}$	187.5%

1. To convert a fraction into percentage, multiply the given fraction by 100 and write the symbol '%' after the product.
2. To convert a decimal into percentage, shift the decimal point by two places to the right and write the symbol '%' after the result.

Expressing numbers in percentages is a very common method used in the comparison of measures. By now it must have become a common word in your vocabulary, as you must be using it to compare the marks scored in all the tests you appear for.

Percentage of a Given Measure

Example 1: What is 41% of 7 kg?

$$\begin{aligned} 41\% \text{ of } 7 \text{ kg} &= \frac{41}{100} \times 7 \text{ kg} = \frac{287}{100} \text{ kg} \\ &= 2.87 \text{ kg or } 2 \text{ kg } 870 \text{ g} \end{aligned}$$

Example 2: 24% of a block of ice weighing 4 kg 350 g melted away. What is the weight of ice now?

Method I

24% of 4.35 kg

$$\begin{aligned} &= \frac{24}{100} \times 4.35 = \frac{104.4}{100} \\ &= 1.044 \text{ kg} \end{aligned}$$

Remaining ice = 4.35 – 1.044

$$= 3.306 \text{ kg}$$

$$= 3 \text{ kg } 306 \text{ g}$$

Method II

Melted percentage of ice = 24%

Remaining percentage of ice = 100 – 24 = 76%

Hence, 76% of 4.35 kg

$$= 3.306 \text{ kg}$$

or

$$3 \text{ kg } 306 \text{ g}$$

Measure as a Percentage of Another Measure

Example 3: 7 l 524 ml of an 8 l 550 ml solution is water. Express it in percentage.

Measure as percentage of another measure

$$\begin{aligned} &= \frac{\text{First measure}}{\text{Second measure}} \times 100\% \\ &= \frac{7.524}{8.550} \times 100\% \\ &= 88\% \end{aligned}$$

Thus, 7 l 524 ml of water is 88% of the 8 l 550 ml solution.

Example 4: Out of 8400 candidates who sat for an entrance examination, only 294 passed. What was the percentage of failures in that examination?

$$\text{Number of failures} = 8400 - 294 = 8106$$

$$\begin{aligned} \text{Percentage of failures} &= \frac{8106}{8400} \times 100\% \\ &= 96.5\% \end{aligned}$$

Try this!

1. Express 56% as a fraction.

2. Express 0.2% as a decimal.

Word Problems

Example 5: Prachi's father gives her 5% of his monthly salary to spend on her birthday. She saves 60% of the money given to her and spends 25% of the rest on a doll. If the doll costs Rs 139.50, how much does Prachee's father earn?



She saves 60%. She spends remaining 40%. Out of 40%, she spends 25% on a doll.

$$25\% \text{ of money spent} = \text{Rs } 139.50$$

$$\Rightarrow \frac{25}{100} \text{ of money spent} = \text{Rs } 139.50$$

$$\Rightarrow \text{Money spent} = \frac{139.50 \times 100}{25} = \text{Rs } 558$$

$$\text{Now, money spent} = (100\% - 60\%) \text{ of money received}$$

$$\text{or } \text{Rs } 558 = 40\% \text{ of money received from her father}$$

$$\text{or } \frac{40}{100} \text{ of money received} = \text{Rs } 558$$

$$\Rightarrow \text{Money received} = \frac{558 \times 100}{40} = \text{Rs } 1395.00$$

$$\text{Now money received} = 5\% \text{ of father's salary}$$

$$\text{or } \text{Rs } 1395 = \frac{5}{100} \text{ of father's salary}$$

$$\Rightarrow \text{Father's salary} = \frac{1395 \times 100}{5} = \text{Rs } 27900.00$$

Example 6: 50% of the people in a restaurant are tea drinkers, 35% are coffee drinkers while 20% drink coffee as well as tea. If 8 people drink coffee as well as tea, how many people in the restaurant drink neither coffee nor tea?

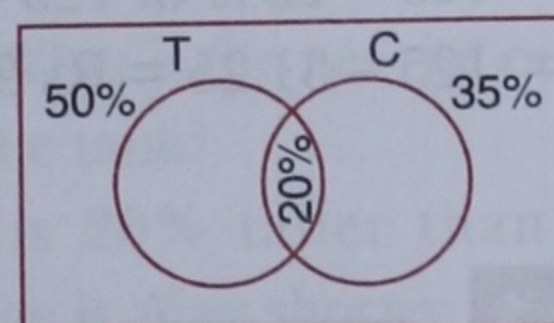
Let us use a Venn diagram to help us solve this problem.

$$\begin{aligned} \text{Percentage of people who drink tea, but not coffee} \\ &= 50\% - 20\% = 30\% \end{aligned}$$

$$\begin{aligned} \text{Percentage of people who drink coffee, but not tea} \\ &= 35\% - 20\% = 15\% \end{aligned}$$

$$\begin{aligned} \text{Thus, people who drink either tea or coffee} \\ &= 30\% + 20\% + 15\% = 65\% \end{aligned}$$

$$\begin{aligned} \text{Thus, people who drink neither tea nor coffee} \\ &= 100\% - 65\% = 35\% \end{aligned}$$



Number of people who drink both coffee and tea = 8

$$\text{Given } 20\% \text{ of total people} = 8$$

$$\text{or } \frac{20}{100} \text{ of total people} = 8$$

$$\Rightarrow \text{Total people in the restaurant} = \frac{8 \times 100}{20} = 40$$

Number of people who drink neither tea nor coffee = 35% of 40 people

$$= \frac{35}{100} \times 40 \text{ people}$$

$$= 14 \text{ people}$$

Example 7: 10% of a cold drink is orange concentrate while the rest is water. If there is 304 ml more of water than orange concentrate, find the volume of the cold drink.

When 10% of total volume is orange concentrate, then 90% of total volume is water.

Difference in percentage of water and orange concentrate = $90\% - 10\% = 80\%$

Difference in volume of water and orange concentrate = 304 ml

Thus 80% of total volume of cold drink = 304 ml

$$\Rightarrow \text{Total volume of cold drink} = \frac{304 \times 100}{80} = 380 \text{ ml}$$

Example 8: The price of onions rises 25% and then falls 25%. What is the net rise or fall per cent in the price of onions?

Let the price of onions before any price change be Rs 100.

After price rise of 25%, price of onions = $100 + 25\% \text{ of } 100 = \text{Rs } 125$

After price fall of 25%, price of onions = $125 - 25\% \text{ of } 125 = 125 - 31.25 = \text{Rs } 93.75$

Thus, net fall in price of onions = $100 - 93.75 = \text{Rs } 6.25$

$$\text{Thus, net fall percentage} = \frac{6.25}{100} \times 100\% = 6.25\%$$

Example 9: Mrs Diwan spends a fixed amount every Diwali for buying candles. If the price of candles has gone up by 50% this year and Mrs Diwan still insists on spending the same amount as last year, by how much percentage must Mrs Diwan reduce her purchase of candles?

If one could buy 100 candles for Rs 100 last year, then one can buy 100 candles for Rs 150 this year.

So this year one can buy $\frac{100}{150} = \frac{2}{3}$ candles for Re 1.

This implies Mrs Diwan can buy $\frac{2}{3} \times 100 = 66\frac{2}{3}$ candles for Rs 100 this year.

Thus, reduction of purchases = $100 - 66\frac{2}{3} = 33\frac{1}{3}$ candles

Thus, reduction percentage = $\frac{\text{reduction}}{\text{previous purchase}} \times 100\% = 33\frac{1}{3}\%$

Mrs Diwan has to buy $33\frac{1}{3}\%$ less candles this year in order to spend the same amount as last year.

Exercise 11.1

1. Express the following in percentage.

(i) $\frac{4}{5}$

(ii) $\frac{7}{20}$

(iii) $3\frac{1}{4}$

(iv) $\frac{16}{25}$

(v) $\frac{66}{80}$

(vi) $\frac{35}{40}$

(vii) $\frac{57}{75}$

(viii) $1\frac{19}{25}$

(ix) $1\frac{1}{40}$

(x) $1\frac{21}{50}$

2. Express the following decimals in percentage.

(i) 0.6

(ii) 0.65

(iii) 1.53

(iv) 0.027

(v) 1.3005

(vi) 0.99

(vii) 1

(viii) 0.218

(ix) 0.0001

(x) 0.01

3. Express the following percentages in fractions as well as decimals.

(i) 40%

(ii) 45%

(iii) 88%

(iv) 16%

(v) 38%

(vi) 55%

- (vii) 124% (viii) $66\frac{2}{3}\%$
 (ix) 62.5% (x) $83\frac{1}{3}\%$

4. What percentage is:

- (i) 474 m of 1 km 896 m?
 (ii) 124 of 80?
 (iii) 4 l 750 ml of 38 l?
 (iv) 26 m of 3 km 250 m?

(v) 2127 graduates of 14180 people?

5. How much is:

- (i) 45% of 180 people?
 (ii) 3% of 150 g?
 (iii) 95% of 4 kg 560 g?
 (iv) 60% of 3 l 905 ml?
 (v) 52% of 94?

6. Mr Lal was earning Rs 14,950 per month when he was given a salary increment of Rs 971.75. What was the percentage rise in Mr Lal's salary?

7. A restaurant sold 1560 bottles of cold drinks in July 2009, but only 858 bottles in August 2009. What was the percentage fall in the sale of cold drinks?

8. Pooja receives Rs 275 as pocket money and spends 30% on books, 35% on toys, 15% on chocolates, and saves the rest. How much money does Pooja save?

9. The price of petrol was Rs 42.50. The price was first increased by 4% and then reduced by 5%. What is the price of petrol now?

10. A worker receives Rs 11,250 as bonus which works out to 15% of his annual salary. What is his monthly salary?

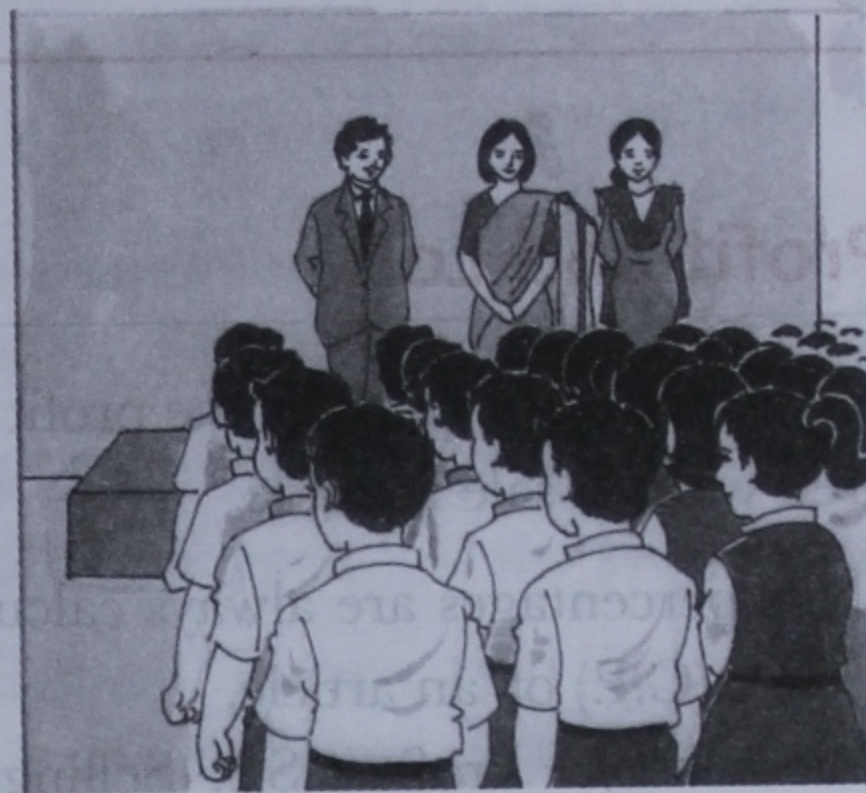
11. A man goes to a gym and loses 8% weight. If his weight loss was 6 kg 560 g, find how much he weighed earlier.

12. 65% of all the fruits in a shop, at the beginning of the day, were apples. After selling 75% of all apples there were 104 apples left at the end of the day. How many fruits were in the shop to begin with?

13. If 60% of the population of a village is 924 villagers, how many villagers will be 25% of the population?

14. The price of potatoes first increased by 10% and then fell by 8%. Find the net percentage change in the price of potatoes.

15. 46% of all attending a school assembly are girls, 52% are boys, and the rest are teachers. If there are 598 boys in the school assembly, how many teachers are there?



16. In a combined test on Maths and Science, 7.5% failed in Maths, 22.5% failed in Science, and 5% failed in both the subjects. If 120 students passed in both subjects, how many students sat for the test?

17. The water level in a tank rises 20% when it is filled in the morning and then falls 20% during the day. What is the net rise or fall in the water level in the tank?

18. If Atul is 20% taller than Ajay, by what percentage is Ajay shorter than Atul?

19. Amir goes to a gym and loses 10% of his weight. His mother thinks he looks too skinny now. By how much percentage must Amir gain weight to return to his previous weight?

20. The bushes in a hedge have grown 25% in height. What percentage of their current height needs to be trimmed off to return them to their former height?

21. A sum of money was distributed between A and B such that A got 60% of all the money. If B got Rs 1170 less than A, how much money was distributed between A and B?

22. 53% of the weight of a concrete slab is cement while the rest is stone and sand. If there is

- 2 kg 160 g more cement than stone and sand in the concrete slab, how much does the slab weigh?
23. Mr Das spends a fixed amount every month on telephone charges. If the telephone charges are increased by 25% and Mr Das still wants to spend the same amount every month, what should be his percentage reduction in telephone calls?

24. The population of a village was 4000 in Jan. 2007. Since then if the population increased by 10% every year, what would be the population of the village in Jan. 2010?
25. The price of onions falls by 25%. By what percentage must the price of onions be increased such that their price is equal to the earlier price?



Profit and Loss

Percentages are used to quantify the profit made or loss suffered when a sale is made.

Profit or loss percentages are always calculated on the Cost Price (C.P.) of an article.

(C.P. + Overheads) + Profit = S.P. (Selling Price)

A profit is made when S.P. > C.P.

$$\text{Profit} = \text{S.P.} - (\text{C.P.} + \text{Overheads})$$

$$\text{Profit percentage} = \frac{\text{Profit}}{\text{Total cost}} \times 100\%$$

(C.P. + Overheads) - Loss = S.P.

A loss is suffered when S.P. < C.P.

or $\text{Loss} = (\text{Cost} + \text{Overheads}) - \text{S.P.}$

$$\text{Loss percentage} = \frac{\text{Loss}}{\text{Total cost}} \times 100\%$$

Example 10: Sharebrokers A and B had bought 500 and 600 shares, respectively, of a company at Rs 33.65 each. During a stock-market crash, A and B sold all their shares, both incurring a loss of Rs 1009.50 each. Whose loss per cent was higher?

Sharebroker A Sharebroker B

$$\begin{array}{l} \text{Cost Price} \quad 500 \times 33.65 \quad 600 \times 33.65 \\ \quad \quad \quad = \text{Rs } 16825.00 \quad = \text{Rs } 20190.00 \end{array}$$

A B

$$\text{Loss Amount} \quad 1009.50 \quad 1009.50$$

$$\left. \begin{array}{l} \text{Loss Percentage} \\ \text{of A} \end{array} \right\} = \frac{1009.50}{16825.00} \times 100\% = 6\%$$

$$\left. \begin{array}{l} \text{Loss Percentage} \\ \text{of B} \end{array} \right\} = \frac{1009.50}{20190.00} \times 100\% = 5\%$$

Although their loss amount was the same, sharebroker A suffered a higher loss per cent.

Example 11: An art dealer buys a painting for Rs 1,35,000 and spends 2% of the price of the painting on framing it. If he then sells the painting earning 12.5% as profit, at what price did he sell it?

$$\text{Cost Price} = \text{Rs } 135000.00$$

$$\text{Framing Cost (2\%)} = \text{Rs } 2700.00$$

$$\text{Total Cost} = \text{Rs } 137700.00$$

$$\text{Profit Amount} = \frac{12.5 \times 137700}{100}$$

$$= \text{Rs } 17212.50$$

$$\text{Selling Price} = \text{Rs } 137700.00 + \text{Rs } 17212.50$$

$$= \text{Rs } 154912.50$$

Example 12: A buys a bicycle and sells it to B at a 5% profit. B rides the bicycle for a month and sells it to C at a loss of 4%. C gets the cycle repaired and sells it to D for Rs 1375.92 making a 5% profit. At what price had A bought the bicycle?

$$\text{C's C.P.} + 5\% \text{ of C's C.P.} = \text{C's S.P.}$$

$$\text{or } \text{C's C.P.} + \frac{5 \times \text{C's C.P.}}{100} = \text{Rs } 1375.92$$

$$\text{or } \frac{100 \times \text{C's C.P.} + 5 \times \text{C's C.P.}}{100} = \text{Rs } 1375.92$$

$$\text{or } C's \text{ C.P.} = \frac{Rs\ 1375.92 \times 100}{105} = Rs\ 1310.40$$

Now C's C.P. = B's S.P.

$$B's \text{ C.P.} - 4\% \text{ of } B's \text{ C.P.} = B's \text{ S.P.}$$

$$\text{or } \frac{100 \times B's \text{ C.P.} - 4 \times B's \text{ C.P.}}{100} = Rs\ 1310.40$$

$$\text{or } B's \text{ C.P.} = \frac{Rs\ 1310.40 \times 100}{96} = Rs\ 1365.00$$

Now B's C.P. = A's S.P.

$$A's \text{ C.P.} + 5\% \text{ of } A's \text{ C.P.} = A's \text{ S.P.}$$

$$\text{or } \frac{100 \times A's \text{ C.P.} + 5 \times A's \text{ C.P.}}{100} = Rs\ 1365.00$$

$$\text{or } A's \text{ C.P.} = \frac{Rs\ 1365.00 \times 100}{105} = Rs\ 1300.00$$

Thus, A had bought the bicycle for Rs 1300.00.

Example 13: A fruit-seller buys litchis at 9 for 1 rupee and sells the litchis at 6 for 1 rupee. What is his profit per cent?

	Quantity	Price
Bought	9	1.00
Sold	6	1.00
		LCM of 9 and 6 = 18
S.P. of 6 litchis	=	Re 1.00
S.P. of 18 litchis	=	$\frac{Re\ 1.00}{6} \times 18$ = Rs 3.00
C.P. of 9 litchis	=	Re 1.00
C.P. of 18 litchis	=	$\frac{Re\ 1.00}{9} \times 18$ = Rs 2.00

Thus, profit amount on sale of 18 litchis
= Rs 3.00 - Rs 2.00 = Re 1.00

$$\text{Thus, profit percentage} = \frac{1.00}{2.00} \times 100\% = 50\%$$

Example 14: A salesman suffers a loss of 5% when he sells some tickets to a flop show. If he had lost another Rs 15.15, his loss per cent would have been 8%. At what price had he bought the tickets?

Let the C.P. of the tickets be x .

$$\text{Given } 8\% \text{ of } x - 5\% \text{ of } x = Rs\ 15.15$$

$$\Rightarrow \frac{8x}{100} - \frac{5x}{100} = 15.15$$

$$\Rightarrow \frac{8x - 5x}{100} = 15.15$$

$$\Rightarrow \frac{3x}{100} = Rs\ 15.15$$

$$\Rightarrow x = \frac{Rs\ 15.15 \times 100}{3} = Rs\ 505.00$$

Thus, the salesman had bought the tickets for Rs 505.00.

Example 15: If the C.P. of 7 mangoes is equal to the S.P. of 6 mangoes, find the profit percentage.

$$\text{Let the C.P. of 1 mango} = Re\ 1$$

$$\text{Then C.P. of 6 mangoes} = Rs\ 6$$

$$\text{Given: S.P. of 6 mangoes} = Rs\ 7 \text{ (C.P. of 7 mangoes)}$$

$$\text{Thus profit on sale of 6 mangoes} = Re\ 1 \text{ (Rs 7 - Rs 6)}$$

$$\text{Profit percentage} = \frac{1}{6} \times 100\% = 16\frac{2}{3}\%$$

Example 16: The profit made by a stationer when he sells 10 geometry boxes is the same as the selling price of 2 geometry boxes. Find the stationer's gain per cent.

$$\begin{aligned} \text{S.P. of 10 boxes} - \text{C.P. of 10 boxes} &= \text{Gain} \\ &= \text{S.P. of 2 boxes (given)} \end{aligned}$$

$$\Rightarrow \text{S.P. of 10 boxes} - \text{S.P. of 2 boxes} = \text{C.P. of 10 boxes (transposition)}$$

$$\Rightarrow \text{S.P. of 8 boxes} = \text{C.P. of 10 boxes}$$

$$\text{Now let C.P. of 1 box} = Rs\ 100$$

$$\Rightarrow \text{C.P. of 8 boxes} = Rs\ 800$$

$$\begin{aligned} \text{But S.P. of 8 boxes} &= \text{C.P. of 10 boxes} \\ &= 10 \times 100 = 1000 \end{aligned}$$

$$\begin{aligned} \therefore \text{Profit on sale of 8 boxes} \\ &= Rs\ 200 \text{ (Rs 1000 - Rs 800)} \end{aligned}$$

$$\therefore \text{Profit percentage} = \frac{200}{800} \times 100\% = 25\%$$

Try this!

1. A man buys an almirah for Rs 2750 and sells it for Rs 2860. Find his gain per cent.

Discount

Sometimes discounts or rebates are offered by shops in order to clear old, damaged stock, or to boost sales. The price printed on the price tag of an article is known as its **marked price** or **listed price**. The price at which the article is sold to the customer is the **selling price**.

$$\text{C.P.} + \text{overheads} + \text{mark-up or profit} = \text{Marked Price}$$

$$\text{Marked price} - \text{Discount} = \text{S.P.}$$

$$\text{or Discount} = \text{Marked Price} - \text{S.P.}$$

Example 17: Mr Banerjee buys a coat for Rs 1285.20 from a fashion boutique announcing a 'factory seconds sale' with 15% off on all purchases. What was the price marked on the coat?



$$\text{Marked Price (M.P.)} - \frac{15 \times \text{M.P.}}{100} = \text{Rs } 1285.20$$

$$\Rightarrow \frac{100 \times \text{M.P.} - 15 \times \text{M.P.}}{100} = \text{Rs } 1285.20$$

$$\Rightarrow \frac{85 \times \text{M.P.}}{100} = \text{Rs } 1285.20$$

$$\Rightarrow \text{M.P.} = \frac{\text{Rs } 1285.20 \times 100}{85} = \text{Rs } 1512.00$$

Thus, the coat was marked at Rs 1512.00.

Example 18: A trader earns 20% of profit on selling TV sets. In order to attract more customers, he announces a 10% discount on all the TV sets he sells. But he does not wish to earn any less profit. What should be his new mark-up per cent?

Let us assume the trader bought the TV sets for Rs 100 each.

100 + mark-up of 20% = Marked price of 120
So he used to earn Rs 20 per TV set.

$$\text{M.P. of } 120 - 10\% \text{ discount} = 120 - 12 = 108$$

Now he would earn only Rs 8 per TV set.

If the TV set is sold to customers for Rs 120, his earning will remain the same.

$$\text{Thus new M.P.} - 10\% \text{ of new M.P.} = \text{Rs } 120$$

$$\Rightarrow \frac{100 \times \text{new M.P.} - 10 \times \text{new M.P.}}{100} = \text{Rs } 120$$

$$\Rightarrow \text{New M.P.} = \frac{120 \times 100}{90} = \text{Rs } 133\frac{1}{3}$$

$$\Rightarrow \text{New M.P.} - \text{C.P.} = \text{mark-up}$$

$$\text{or } \text{Rs } 133\frac{1}{3} - \text{Rs } 100 = \text{Rs } 33\frac{1}{3}$$

$$\therefore \text{Mark-up per cent} = 33\frac{1}{3} \times \frac{100}{100} \% = 33\frac{1}{3} \%$$

Thus, if the trader adds $33\frac{1}{3}\%$ to his C.P., even after giving a 10% discount, his earning will be 20%.

Try this!

A shopkeeper allows a discount of 10% on the marked price. How much above cost price must he mark his goods to gain 8%?

Successive Discount

On special occasions, a selling establishment may offer an additional special discount over an ongoing discount. Such discounts, known as successive discounts, are calculated one after the other on the marked price.

Example 19: Mrs Emily D'Costa bought a plum cake for Rs 267.75 from a bakery advertising a special Christmas discount of 15% over and above the ongoing festival discount of 10%. What was the listed price of the plum cake?

Price after festival discount–Christmas discount
= Rs 267.75

⇒ Price after festival discount

$$\frac{15 \times \text{Price after festival discount}}{100} = \text{Rs } 267.75$$

$$\Rightarrow \text{Price after festival discount} = \frac{\text{Rs } 267.75 \times 100}{85} = \text{Rs } 315$$

$$\text{Listed Price} - \text{festival discount} = \text{Price after festival discount}$$

$$\Rightarrow \text{Listed Price} - \frac{10 \times \text{Listed Price}}{100} = \text{Rs } 315$$

$$\Rightarrow \text{Listed Price} = \frac{315 \times 100}{90} = \text{Rs } 350$$

Try this!

After getting two successive discounts, a shirt with a first price of Rs 150 is available at Rs 105. If the second discount is 12.5%, find the first discount.

Exercise 11.2

Thus the cake was listed at Rs 350.

1. A tea-stall owner bought 2 dozen fruitcakes at Rs 1.75 each and sold them all earning a profit of 65%. How much profit did the tea-stall owner make?



2. A trader bought 15 m of cloth at Rs 54.50 per metre, but the cloth got infested with silver-fish. If he had to sell off the cloth suffering a loss of 64%, how much money did he lose?
3. A roadside vendor sells all his wares at a $33\frac{1}{3}\%$ profit. If he bought 19 caps for Rs 285, at what price will he sell each cap?
4. 28 pears that a fruit-seller had bought for Rs 3.60 each, begin to spoil. So they are sold to a stablehand at a loss of 45%. How much money did the stablehand pay to the fruit-seller?
5. What is the gain per cent if 25 mangoes bought at Rs 4.50 each are sold for Rs 132.75?
6. What is the loss per cent if 96 berries bought at Rs 42 per dozen are sold for Rs 252?
7. A trader bought 3 dozen eggs at Re 0.75 each and wishes to earn 60% profit on selling them all, but 1 dozen eggs break in storage. At what price must the trader sell each of the remaining eggs to earn the same profit amount?
8. A carpenter buys wood worth Rs 1502, screws and nails worth Rs 53, adhesives and some tools for Rs 175. He then uses up all the material he had bought to make 3 chairs which he sells at Rs 340 each and 4 peg tables which he sells at Rs 440 each. If he then sells the tools he had bought to a plumber for Rs 22.60, find the carpenter's profit percentage.
9. A mechanic buys an old refrigerator for Rs 2130 and spends Rs 1624 on repairing and painting it. If the refrigerator is sold for Rs 3735.23, find the mechanic's gain or loss per cent.

10. A mechanic buys an old TV for Rs 2250 and an old music system for Rs 2875. He spends Rs 250 on repairing the TV and Rs 125 on repairing the music system. If the TV is sold at a 20% profit and the music system is sold at a 15% loss, find his net profit or loss percentage.
11. If a plastic chair is being sold at a 35% profit for Rs 202.50, at what price had it been bought?
12. If at a 'Seconds Sale', a sari is being sold at an 8% loss, for Rs 956.80, at what price had it been bought?
13. A grocer buys 26 kg of flour and spends Rs 49 on storing it. If he sold all the flour for Rs 416 earning a profit of 4%, how much had the grocer paid for 1 kg of flour?
14. A medicine superstockist buys 25 strips of antibiotics which he sells to a stockist at a 20% profit. The stockist sells the antibiotics to a retail shop, earning 5%. The retail shop sells the 25 strips to patients for Rs 107.73 each, earning a profit of 12.5%. How much had the superstockist paid for the 25 strips of antibiotics?
15. The amount that a gardener receives on selling 180 seedlings is the same as the amount he had paid to buy 240 seedlings. What is the gardener's gain per cent?
16. If a real estate agent suffers a 3% loss when he sells an apartment for Rs 12,36,750, at what price should he have sold the apartment to earn a profit of 20%?
17. A shopkeeper buys coffee worth Rs 230 and tea worth Rs 150. If he sells the coffee at a 20% profit, at what per cent profit must he sell the tea in order to earn 25% overall on selling the tea and coffee?
18. A watch is sold by a salesman at a profit of 15%. If the selling price of the watch had been Rs 48 more, the profit per cent would have been 18%. At what price had the salesman bought the watch?
19. Facing financial problems, a real estate investor is forced to sell an apartment suffering a 7% loss. If the apartment had been sold for Rs 43080 less, his loss would have been 10%. At what price was the apartment sold?
20. If the cost price of 4 pencils is the selling price of 3 pencils, find the profit percentage.
21. If the cost price of 7 magazines is the selling price of 8 magazines, find the loss percentage.
22. The profit made by a sweetmeat shop when it sells 6 *laddoos* is equal to the selling price of 2 *laddoos*. Find the sweetmeat shop's gain percentage.
23. The price at which a flower-girl had bought a dozen flowers is the same as the price at which she is selling 8 flowers. What is her profit percentage?
24. The loss suffered by a flower-girl when she sells 25 flowers is equal to the selling price of 5 flowers. Find her loss percentage.
25. A stationer sells 8 ballpoint pens for the price of 10 ballpoint pens. What is the stationer's profit percentage?
26. An old woman buys 25 berries for a rupee. How many berries should she sell for a rupee such that she gains 25%?
27. What rate of discount is being given if a pair of shoes with Rs 699.00 printed on the soles is selling for Rs 524.25?
28. A clothes store offers 40% OFF on kidswear and 20% OFF on all other products. If Mrs Bhatnagar buys Rs 3915.50 worth of sarees for herself and clothes worth Rs 1895.70 for her little son, how much money will she have to pay?



29. A trader marks up all his products at $66\frac{2}{3}\%$ above cost price. After allowing a 25% discount on selling an article, he receives Rs 416.25. At what price had the trader bought the article?
30. Even after offering a 15% discount to his customers, a trader is still earning a 19% profit. By how much percentage has the trader marked up his cost price?
31. A jeweller announces a 20% Diwali discount on all sales but instructs his accountant that he still wants to earn the same 25% as before. By how much should the accountant mark up the cost price?
32. Mrs Anu Mishra bought a gold necklace for Rs 7208 on *Dhanteras* in a jewellery store advertising successive discounts of 20% and 15%. What was the marked price of the necklace?
33. In a shop advertising a cash discount of 10% over and above a Summer Discount of 15%, a sales clerk wrongly allowed a single discount of 25% to sell a frock for Rs 562.50. At what price should the frock have been sold?
34. A shopowner offers three successive discounts of 20%, 15%, and 10% to his customers. The sales clerk wishes to avoid having to make so many calculations and works out a single discount percentage. What is the single percentage to be deducted from the marked price?
35. A wholeseller buys motorcycles and sells them to stockists at a 12% profit. The stockists sell the motorcycles to retailers at a 15% profit. A retailer marks up his cost price by 25% and then offers a 15% discount. If a customer buys a motorcycle for Rs 65688, what price had the wholeseller paid for it?

Simple Interest

When a loan is taken, over and above the money to be repaid, an extra amount of money is paid for using another's money. This extra money is known as **interest**.

Money taken on loan	—	Principal
Extra money to be paid	—	Interest
Total money repaid	—	Amount

The interest payable for using a principal (P) over a period of time (T) at an interest rate agreed upon

(R) is given by the formula $I = \frac{PRT}{100}$

where R is a percentage rate per time period, which is in the same unit as T.

Example 20: A farmer takes a Rs 3,50,000 loan at 9.25% per annum from a cooperative bank and repays the loan after $2\frac{1}{2}$ years. What is the total amount repaid by the farmer?

$I = ?$, given: $P = \text{Rs } 350000$, $R = 9.25\%$
and $T = 2.5$ years

$$\begin{aligned} \text{As } I &= \frac{PRT}{100} \\ I &= \frac{350000 \times 9.25 \times 2.5}{100} = \text{Rs } 80937.50 \end{aligned}$$

$$\begin{aligned} \text{Amount} &= \text{Principal} + \text{Interest} \\ &= \text{Rs } 350000.00 + \text{Rs } 80937.50 \\ &= \text{Rs } 430937.50 \end{aligned}$$

Thus, the farmer repays Rs 4,30,937.50 in all.

Example 21: A man earns Rs 247.50 as interest when he deposits Rs 20,075 in a short-term fixed deposit account for 45 days. What was the rate of interest given by the fixed deposit account?

$R = ?$, given: $P = 20075$, $T = \frac{45}{365}$ years and $I = 247.50$

$$\begin{aligned} I &= \frac{PRT}{100} \\ \Rightarrow R &= \frac{I \times 100}{PT} = \frac{247.50 \times 100}{20075 \times \frac{45}{365}} \\ &= \frac{247.50 \times 100 \times 365}{20075 \times 45} = 10\% \end{aligned}$$

Thus, the fixed deposit account gave a 10% rate of interest.

Example 22: Shylock Moneylenders Ltd charges 5% as interest per month. If a potter has to pay Rs 945 as interest after only $3\frac{1}{2}$ months, how much money had the potter taken as loan?

$P = ?$, given: $I = \text{Rs } 945$, $R = 5\%$ per month and $T = 3.5$ months

$$I = \frac{PRT}{100}$$

$$\Rightarrow P = \frac{I \times 100}{RT} = \frac{945 \times 100}{5 \times 3.5} = \text{Rs } 5400$$

Hence, the potter had taken a loan of Rs 5400.

Example 23: How long would it take for a sum of money to become $1\frac{3}{5}$ of itself at 2.5% interest per month?

Let $P = \text{Rs } 100$, then Amount = $100 \times 1\frac{3}{5} = \text{Rs } 160$

Thus $I = A - P = 160 - 100 = \text{Rs } 60$

$T = ?$ months, $P = \text{Rs } 100$, $R = 2.5\%$ per month and $I = \text{Rs } 60$

$$I = \frac{PRT}{100}$$

$$\Rightarrow T = \frac{I \times 100}{PR} = \frac{60 \times 100}{100 \times 2.5} = 24 \text{ months or 2 years}$$

Example 24: A businessman takes a Rs 3 lakh loan at 7.3% p.a. from a friend on 01.04.2009 and repays Rs 75,000 on 20.07.2009 and Rs 1,50,000 on 18.12.2009. If he clears all his dues on 14.02.2010, how much money did he return in all?

As the loan has been repaid over three instalments, the interest will be calculated over three time periods.

$T_1 = 01.04.2009 - 20.07.2009$

April	30
May	31
June	30
July	20

111 days – 1 day = 110 days

(If the loan taken on 01.04.2009 is repaid on 02.04.2009, then the businessman would be charged only $2 - 1 = 1$ day's interest.)

$T_2 = 20.07.2009 - 18.12.2009$

July	12
Aug	31
Sep	30
Oct	31
Nov	30
Dec	18

152 days – 1 day = 151 days

$T_3 = 18.12.2009 - 14.02.2010$

Dec	14
Jan	31
Feb	14

59 days – 1 day = 58 days

The Principal will reduce with each repayment as

$$P_1 \text{ for } T_1 = \text{Rs } 300000$$

$$P_2 \text{ for } T_2 = \text{Rs } 300000 - \text{Rs } 75000 = \text{Rs } 225000$$

$$P_3 \text{ for } T_3 = \text{Rs } 225000 - \text{Rs } 150000 = \text{Rs } 75000$$

Interest from 01.04.2009–20.07.2009

$$I_1 = \frac{P_1 R T_1}{100} = \frac{300000 \times 7.3 \times \frac{110}{365}}{100} = \text{Rs } 6600.00$$

Interest from 20.07.2009–18.12.2009

$$I_2 = \frac{P_2 R T_2}{100} = \frac{225000 \times 7.3 \times \frac{151}{365}}{100} = \text{Rs } 6795.00$$

Interest from 18.12.2009–14.02.2010

$$I_3 = \frac{P_3 R T_3}{100} = \frac{75000 \times 7.3 \times \frac{58}{365}}{100} = \text{Rs } 870.00$$

$$\text{Total Interest paid} = \text{Rs } 14265.00$$

$$\text{Principal repaid} = \text{Rs } 300000.00$$

$$\text{Total amount returned} = \text{Rs } 314265.00$$

Example 25: A Rs 80,000 loan was given under two schemes. Scheme I charged interest at 9.25%

while Scheme II charged a different rate of interest. If the interest due on both the schemes was Rs 2775 after one year, find how much money was given under Scheme II and at what rate of interest.

$P_1 = ?$, given: $R = 9.25\%$, $T = 1$ and $I = 2775$

$$I = \frac{PRT}{100} \Rightarrow P_1 = \frac{I \times 100}{RT} = \frac{2775 \times 100}{9.25 \times 1} = \text{Rs } 30000$$

given $P_1 + P_2 = \text{Rs } 80000$

$$\Rightarrow P_2 = 80000 - P_1 = 80000 - 30000 = \text{Rs } 50000$$

Thus, Rs 30000 was loaned at 9.25% p.a. while Rs 50000 was loaned at $R_2\%$ per annum.

$$R_2 = \frac{2775 \times 100}{50000 \times 1} = 5.55\%$$

Thus, under Scheme II, Rs 50,000 was loaned at 5.55% p.a.

Example 26: Mr Chopra deposited his savings in a bank deposit scheme. At the end of the third year his savings had grown to Rs 6,41,250 and at the end of the fifth year to Rs 7,08,750. How much money had Mr Chopra deposited and at what per cent interest?

$$\text{Amount after 5 years} = \text{Rs } 708750$$

$$\text{Amount after 3 years} = \text{Rs } 641250$$

$$\text{Interest for 2 years} = \text{Rs } 67500$$

$$\text{Interest for 1 year} = \text{Rs } \frac{67500}{2} = \text{Rs } 33750$$

Exercise 11.3

- How much interest is to be paid on a loan of Rs 56,500 at 10.5% p.a. after 3 years?
- How much interest is to be paid on a loan of Rs 50,000 at 6.57% p.a., if the loan is availed from 03.03.2004 till 09.04.2004?
- If Hanif Ahmed had taken Rs 84,000 from the village moneylender at 3.5% per month, how much money will he have to return to the moneylender after $1\frac{1}{2}$ years?

$$\begin{aligned} \text{Thus Interest for 3 years} &= \text{Rs } 33750 \times 3 \\ &= \text{Rs } 101250 \end{aligned}$$

$$\begin{aligned} \text{Principal} &= \text{Amount after 3 years} - \text{Interest after 3 years} \\ &= \text{Rs } 641250 - 101250 = \text{Rs } 540000 \end{aligned}$$

$$I = \frac{PRT}{100}$$

$$\Rightarrow R = \frac{I \times 100}{PT} = \frac{101250 \times 100}{540000 \times 3} = 6.25\%$$

(calculating for 3 years)

$$\text{Or } R = \frac{33750 \times 100}{540000 \times 1} = 6.25\%$$

(calculating for 1 year)

Thus, Mr Chopra deposited Rs 540,000 at 6.25% interest p.a.

Try this!

A man borrowed Rs 24000 from two moneylenders. For one loan he paid 15% p.a. and for the other 18% p.a. At the end of one year, he paid Rs 4050. How much did he borrow at each rate?



4. Mr Rakshit promises to pay interest to his friend when he borrows Rs 4,50,000 for running his business. The business does well and Mr Rakshit pays his friend Rs 1,50,000 as interest after one year. What annual rate of interest did his friend's money earn?
5. An office receptionist took Rs 8000 as a personal loan from the manager for 6 months at 11% p.a. At the end of six months she gave the manager Rs 3500 and a gold coin to settle her dues. At what price did the manager get the gold coin?
6. If Rs 24,500 grows to Rs 26,705 in a company's fixed deposit in just 6 months, what is the rate of interest given by the fixed deposit scheme?
7. A weaver who had taken a Rs 40,000 loan from a moneylender finds that he has to pay Rs 44,500 to clear his dues after only 75 days. Find the annual rate of interest charged by the moneylender.
8. If a Rs 86,000 loan amounts to Rs 98,900 in 2 years, how much will it amount to in 3 years at the same rate of interest?
9. Mr Sengupta who had taken a house-building loan at 11.5% p.a. pays Rs 2,99,000 as interest when he repays the loan after 4 years. How much money had Mr Sengupta taken as loan?
10. A sharebroker takes a short-term loan on 05.04.2004 at 3% per month and then pays Rs 1155 as interest when he repays the loan on 08.05.2004. How much money had the sharebroker taken on loan?
11. Salim borrows Rs 3500 from Suresh and promises to pay 12.5% p.a. as interest. If he repays Rs 4156.25 to Suresh to clear his dues, how long did he take to repay the loan?
12. How long would it take for a sum of money to become $1\frac{3}{4}$ of itself at 3.75% interest per month?
13. How long would it take for a sum of money to become $1\frac{21}{25}$ of itself at $2\frac{1}{3}\%$ interest per month?
14. At what rate of interest will a sum of money treble itself in 6 years?
15. Mr Shah borrowed a certain sum of money. After 2 years the amount to be repaid was Rs 8,38,500 and at the end of 3 years the amount to be repaid was Rs 9,32,750. How much money had Mr Shah borrowed and at what rate of interest?
16. Diksha borrowed some money from Divya and agreed to pay interest at an annual rate as Divya asked for. After 40 days, the amount due to Divya was Rs 4608 and after 55 days it was Rs 4648.50. How much money had Divya loaned to Diksha and what rate of interest had she asked for?
17. A and B went to a moneylender to borrow Rs 60,000 between themselves. The money lender gave A a loan at 28% p.a. and B a loan at a higher rate of interest. If both A and B had to pay the moneylender Rs 9,800 as interest after a year, how much money was lent to B and at what rate of interest?
18. A father and son deposited Rs 1 lakh in different deposit schemes. The father, being a 'senior citizen, got 9% interest p.a. while the son got a lesser rate of interest. If both their deposits earned Rs 1800 in 6 months, find how much money had the son deposited and at what rate of interest.
19. A certain investment takes 18 years to grow 5 times. How long would it take to double itself? What annual rate of interest does the investment earn?
20. On 01.04.2004 Preeti takes a study loan of Rs 4.5 lakh from a bank at a concessional rate of 4.8% p.a. On 01.10.2007 she repays Rs 2.5 lakh. How much money will Preeti owe to the bank on 01.06.2009?

Compound Interest

When the interest earned is continuously reinvested to increase the principal amount, the total interest earned is known as compound interest.

Let us compare the difference between a loan of Rs 100 earning 10% per annum at simple and compound interest over 3 years.

At the end of 1 year, $P = 100$, $R = 10\%$, $T = 1$

$$\text{Simple Interest} = \frac{100 \times 1 \times 10}{100} = 10$$

$P = 100$, $R = 10\%$, $T = 1$

$$\text{Compound Interest} = \frac{100 \times 1 \times 10}{100} = 10$$

At the end of 2 years, $P = 100$, $R = 10\%$, $T = 1$

$$\text{S.I} = \frac{100 \times 1 \times 10}{100} = 10$$

In the case of C.I, $P = 100 + 10 = 110$,
 $R = 10\%$, $T = 1$

$$\text{C.I} = \frac{110 \times 1 \times 10}{100} = 11$$

At the end of 3 years, $P = 100$, $R = 10\%$, $T = 1$

$$\text{S.I} = \frac{100 \times 1 \times 10}{100} = 10$$

In the case of C.I, $P = 110 + 11 = 121$,
 $R = 10\%$, $T = 1$

$$\text{C.I} = \frac{121 \times 1 \times 10}{100} = 12.10$$

Total simple interest earned S.I = Rs 30

Total compound interest (C.I) earned = Rs 33.10

For calculation of simple interest, the principal amount remains the same. However, when interest is compounded, the principal keeps changing.

Example 27: Calculate the compound interest on Rs 15000.00 at 8% per annum over 3 years.

For interest at the end of year 1, $P = 15000$,
 $R = 8\%$, $T = 1$

$$I_1 = \frac{15000 \times 8 \times 1}{100} = 1200.00$$

For interest at the end of year 2,

$P = 15000 + 1200 = 16200$, $R = 8\%$, $T = 1$

$$I_2 = \frac{16200 \times 8 \times 1}{100} = 1296.00$$

For interest at the end of year 3,

$P = 16200 + 1296 = 17496$, $R = 8\%$, $T = 1$

$$I_3 = \frac{17496 \times 8 \times 1}{100} = 1399.68$$

Total compound interest = $I_1 + I_2 + I_3$

$$= 1200.00 + 1296.00 + 1399.68$$

$$= \text{Rs } 3895.68$$

Example 28: Find the difference between simple interest and compound interest if a loan of Rs 22000 is taken for 4 years at 10% per annum.

Calculation of Simple Interest

$$I = \frac{22000 \times 10 \times 4}{100} = \text{Rs } 8800$$

Calculation of Compound Interest

For interest at the end of year 1, $P = 22000$,

$R = 10\%$, $T = 1$

$$I_1 = \frac{22000 \times 10 \times 1}{100} = 2200$$

For interest at the end of year 2,

$P = 22000$, $R = 10\%$, $T = 1$

$$I_2 = \frac{24200 \times 10 \times 1}{100} = 2420$$

For interest at the end of year 3,

$P = 24000 + 2420 = 26620$, $R = 10\%$, $T = 1$

$$I_3 = \frac{26620 \times 10 \times 1}{100} = 2662$$

For interest at the end of year 4,

$P = 26620 + 2662 = 29282$, $R = 10\%$, $T = 1$

$$I_4 = \frac{29282 \times 10 \times 1}{100} = 2928.20$$

Total compound interest = $I_1 + I_2 + I_3 + I_4$

$$= 2200 + 2420 + 2662 + 2928.20$$

$$= \text{Rs } 10210.20$$

Difference in C.I and S.I = $10210.20 - 8800.00$

$$= \text{Rs } 1410.20$$

Example 29: Calculate the compound interest on Rs 25000 over 3 years if the rate of interest over successive years is 8%, 9% and 10%.

For interest over year 1, $P = 25000$, $R = 8\%$ and $T = 1$

$$\Rightarrow I_1 = \frac{25000 \times 8 \times 1}{100} = \text{Rs } 2000$$

For interest over year 2, $P = 25000 + 2000 = 27000$, $R = 9\%$ and $T = 1$

$$\Rightarrow I_2 = \frac{27000 \times 9 \times 1}{100} = \text{Rs } 2430$$

For interest over year 3, $P = 27000 + 2430 = 29430$, $R = 10\%$ and $T = 1$

$$\Rightarrow I_3 = \frac{29430 \times 10 \times 1}{100} = \text{Rs } 2943$$

$$\begin{aligned} \text{Thus compound interest} &= I_1 + I_2 + I_3 \\ &= 2000 + 2430 + 2943 \\ &= \text{Rs } 7373 \end{aligned}$$

The interest on government saving schemes and long term bank deposits is compounded annually. So, if a fixed deposit is offering, say 9%, per annum over 5 years, then the '**effective rate of interest**' will be more than that. The next example will help us understand this better.

Example 30: If a fixed deposit bears 12% interest compounded annually, calculate the effective rate of simple interest over 4 years. Round off the answer to 1 decimal place.

Let an amount of Rs 10000 be deposited in this scheme.

$$P_1 = 10000; \quad I_1 = \frac{10000 \times 12 \times 1}{100} = 1200$$

$$P_2 = 10000 + 1200 = 11200; \quad I_2 = \frac{11200 \times 12 \times 1}{100} = 1344$$

$$P_3 = 11200 + 1344 = 12544; \quad I_3 = \frac{12544 \times 12 \times 1}{100} = 1505.28$$

$$P_4 = 12544 + 1505.28 = 14049.28;$$

$$I_4 = \frac{14049.28 \times 12 \times 1}{100} = 1685.91$$

$$\begin{aligned} \text{Total compound interest} &= I_1 + I_2 + I_3 + I_4 \\ &= 1200 + 1344 + 1505.28 + 1685.91 \\ &= 5735.19 \end{aligned}$$

Now if $I = 5735.19$, $T = 4$ years, $P = 10000$, $R = ?$

$$\begin{aligned} I &= \frac{PRT}{100} \\ \Rightarrow R &= \frac{I \times 100}{PT} = \frac{5735.19 \times 100}{10000 \times 4} \\ &= 14.337975\% = 14.3\% \end{aligned}$$

Thus the effective rate of interest over 4 years 14.3%.

Try this!

Find the compound interest on Rs 8000 at 10% p.a. for 3 years, compounded annually.

Exercise 11.4

1. A sum of Rs 50,000 is invested at 9% per annum compound interest for 3 years.

Find the (a) interest due for the first year

(b) interest due for the second year.

(c) interest due for the third year.

(d) compound interest for three years

(e) amount on maturity of the investment

2. A loan of Rs 1,25,000 is taken at 11% per annum compound interest for 4 years. Calculate the following to the nearest rupee.

(a) interest due for the first year.

(b) interest due for the third year.

(c) amount payable at the end of 4 years.

3. Varun invests Rs 75,000 for 5 years in a fixed deposit that offers 10% per annum. How much compound interest does he earn at the end of the term?

4. Find the difference between the amount to be repaid if a loan of Rs 50,000 is taken at 12% p.a. over 3 years at simple and compound interest.

5. Sheetal invest Rs 1 lakh in a 5-year deposit scheme that offers 10% simple interest and another Rs 1 lakh in a 5-year scheme that offers 9% compound interest. In which scheme does she earn more and by how much ?
6. Calculate the compound interest on Rs 1,50,000 over 2 years if the rate of interest over successive years is 10% and 11%.

7. Calculate the compound interest on Rs 45,000 over 3 years if the rate of interest over successive years is 5% , 8% and 10%.
8. If a deposit is offering 10% compounded over 4 years, find the effective rate of simple interest.

Revision Exercise

1. Express the following in percentage :

(i) $5\frac{1}{8}$

(ii) $\frac{24}{25}$

(iii) 1.975

(iv) 8.63

2. Express the following percentage in fractions as well as decimals.

(i) 35%

(ii) $33\frac{1}{2}\%$

(iii) 276%

(iv) 24.7%

3. Himani obtained 950 marks out of 1350 and Lakshita obtained 1195 marks out of 1475. Whose performance is better ?
4. A cloth merchant, on selling 44 metres of cloth, gets a profit equal to the selling price of 22 metres of cloth. Find his profit percent.
5. How long would it take for a sum of money to become $2\frac{4}{7}$ of itself at 3.5% interest per month ?

Mental maths

1. Let 100% marks in an exam be 600.

Then 80% marks = _____

2. If S.I on a particular sum of money at 4% for one year is Rs 120, the compound interest for one year = _____

3. If $75\% = \frac{3}{4}$, then $\frac{4}{3} =$ _____%

4. $0.88 =$ _____%

5. If two pairs of jeans cost Rs 1800, price after 20% discount = _____