Exercise 7.2

1. Find the profit or loss percentage, when:

(i) C.P. = ₹ 400, S.P. = ₹ 468

(ii) C.P. = ₹ 13600, S.P. = ₹ 12104

Solution:

(i) It is given that

C.P. = ₹ 400, S.P. = ₹ 468

Profit = S.P. – C.P.

Substituting the values

= 468 – 400

= ₹ 68

Here

Profit % = (Profit × 100)/ C.P.

Substituting the values

= (68 × 100)/ 400

= 17 %

(ii) It is given that

C.P. = ₹ 13600, S.P. = ₹ 12104

Loss = C.P. – S.P.

Substituting the values

= 13600 – 12104

= ₹ 1496

Here

Loss % = [Loss/C.P. × 100] %

Substituting the values

= [1496/ 13600 × 100] %

So we get

= 1496/ 136 %

= 11 %

2. By selling an article for ₹ 1636.25, a dealer gains ₹ 96.25. Find his gain per cent.

Solution:

It is given that

S.P. of an article = ₹ 1636.25

Gain = ₹ 96.25

So the C.P. = S.P. – Gain

Substituting the values

= 1636.25 – 96.25

= ₹ 1540

We know that

Gain % = [Gain/ C.P. × 100] %

Substituting the values

= [96.25/1540 × 100] %

By further calculation

= 9625/1540 %

= 1925/308 %

So we get

= 25/4 %

= 6 ¼ %

3. By selling an article for ₹ 770, a man incurs a loss of ₹ 110. Find his loss percentage.

Solution:

It is given that

S.P. of an article = ₹ 770

Loss = ₹ 110

We know that

C.P. = S.P. + Loss

Substituting the values

= 770 + 110

= ₹ 880

Here

Loss % = [Loss/ C.P. × 100] %

Substituting the values

= [110/ 880 × 100] %

By further calculation

= 100/8 %

So we get

= 25/2 %

= 12.5 %

4. Rashida bought 25 dozen eggs at the rate of ₹ 9.60 per dozen. 30 eggs were broken in the transaction and she sold the remaining eggs at one rupee each. Find her gain or loss percentage.

Solution:

It is given that

C.P. of one dozen eggs = ₹ 9.60

C.P. of 25 dozen eggs = 25 × 9.60 = ₹ 240

No. of eggs = 25 dozen = 25 × 12 = 300

No. of eggs broken in transaction = 30

No. of remaining eggs = 300 – 30 = 270

We know that

S.P. of one egg = ₹ 1

S.P. of 270 eggs = 1 × 270 = ₹ 270

So the profit = S.P. – C.P.

Substituting the values

= 270 – 240

= ₹ 30

Here

Profit % = [Profit/ C.P. × 100] %

Substituting the values

= [30/240 × 100] %

So we get

= 100/8 %

= 25/2 %

= 12.5 %

5. The cost of an article was ₹ 20000 and ₹ 1400 were spent on its repairs. If it is sold for a profit of 20 %, find the selling price of the article.

Solution:

It is given that

Cost of an article = ₹ 20000

Cost of its repair = ₹ 1400

So the total cost = 20000 + 1400 = ₹ 21400

Profit = 20 %

We know that

S.P. = [C.P. × (100 + Profit %)]/ 100

Substituting the values

= [21400 × (100 + 20)]/ 100

By further calculation

= (21400 × 120)/ 100

= ₹ 25680

6. A shopkeeper buys 200 bicycles at ₹ 1200 per bicycle. He spends ₹ 30 per bicycle on transportation. He also spends ₹ 4000 on advertising. Then he sells all the bicycles at ₹ 1350 per piece. Find his profit or loss. Also, calculate it as a percentage.

Solution:

It is given that

C.P. of one bicycle = ₹ 1200

C.P. of 200 bicycle = 1200 × 200 = ₹ 240000

Expenditure on transportation for one bicycle = ₹ 30

Expenditure on transportation for 200 bicycle = 30 × 200 = ₹ 6000

Expenditure on advertising = ₹ 4000

We know that

Net C.P. of the bicycle = 240000 + 6000 + 4000

= ₹ 250000

S.P. of 200 bicycle at ₹ 1350 per bicycle = 200 × 1350

= ₹ 270000

So profit = S.P – C.P.

Substituting the values

= 270000 – 250000

= ₹ 20000

Here

Profit % = [Profit/ C.P. × 100] %

Substituting the values

= [20000/ 250000 × 100] %

So we get

= 200/25 %

= 8%

7. The cost price of an article is 90% of its selling price. Find his profit percentage.

Solution:

Consider ₹ x as the S.P. of an article

C.P. of an article = 90% of ₹ x

It can be written as

= 90/100 × ₹ x

= ₹ 9x/10

We know that

Profit = S.P. – C.P.

Substituting the values

= x – 9x/10

Taking LCM

= (10x – 9x)/ 10

= ₹ x/10

Here

Profit % = [Profit/ C.P. × 100] %

Substituting the values

= [x/10/ 9x/10 × 100] %

It can be written as

= [x/10 × 10/9x × 100] %

So we get

= 100/ 9 %

= 11 1/9 %

8. Rao bought notebooks at the rate of 4 for ₹ 35 and sold them at the rate of 5 for ₹ 58. Calculate

(i) his gain percentage.

(ii) the number of notebooks he should sell to earn a profit of ₹ 171.

Solution:

Consider the number of note books bought = 20

Here the LCM of 4 and 5 is 20

C.P. of the note books = 35/4 × 20

= 35 × 5

= ₹ 175

S.P. of the note books = 58/5 × 20

= 58 × 4

= ₹ 232

(i) We know that

Gain = S.P. – C.P.

Substituting the values

= 232 – 175

= ₹ 57

Here

Gain % = [Gain/ C.P. × 100] %

Substituting the values

= [57/ 175 × 100] %

By further calculation

= [57/7 × 4] %

So we get

= 228/7 %

= 32 4/7 %

(ii) When the profit is ₹ 57, the number of note books sold = 20

When the profit is ₹ 1, the number of note books sold = 20/57

When the profit is ₹ 171, the number of note books sold = 20/57 × 171

= 20 × 3

= 60

9. A vendor buys bananas at 3 for a rupee and sells at 4 for a rupee. Find his profit or loss percentage.

Solution:

Consider the number of bananas bought = 12

Here LCM f 3 and 4 is 12

We know that

C.P. of bananas = 1/3 × 12 = ₹ 4

S.P. of bananas = ¼ × 12 = ₹ 3

Here

Loss = C.P. – S.P.

Substituting the values

= 4 – 3

= ₹ 1

Loss % = [Loss/ C.P. × 100] %

Substituting the values

= [1/4 × 100] %

So we get

= 100/4 %

= 25 %

10. A shopkeeper buys a certain number of pens. If the selling price of 5 pens is equal to the cost price of 7 pens, find his profit or loss percentage.

Solution:

Consider ₹ x as the C.P. of 7 pens

C.P. of 1 pen = ₹ x/7

Based on the question

S.P. of 5 pens = ₹ x

S.P. of 1 pen = ₹ x/5

Profit = S.P. – C.P.

Substituting the values

= x/7 – x/5

Taking LCM

= (7x – 5x)/ 35

= ₹ 2x/ 35

We know that

Profit % = Profit/C.P. × 100 %

Substituting the values

= 2x/ 35/ x/7 × 100 %

It can be written as

= 2x/35 × 7/x × 100 %

By further calculation

= 2/5 × 100 %

So we get

= 2 × 20 %

= 40 %

11. Find the selling price, when:

(i) Cost price = ₹ 2360, Profit = 8 %

(ii) Cost price = ₹ 380, Loss = 7.5 %

Solution:

(i) It is given that

Cost price = ₹ 2360, Profit = 8%

We know that

S.P. = (100 + Profit %)/ 100 × C.P.

Substituting the values

= (100 + 8)/ 100 × 2360

By further calculation

= 108/ 100 × 2360

So we get

= 108/ 10 × 236

= ₹ 2548.80

(ii) It is given that

Cost price = ₹ 380, Loss = 7.5 %

We know that

S.P. = (100 – Loss %)/ 100 × C.P.

Substituting the values

= (100 – 7.5)/ 100 × 380

By further calculation

= 92.5/ 100 × 380

So we get

= 9.25 × 38

= ₹ 351.50

12. A dealer bought a number of eggs at ₹ 18 a dozen and sold them at 50% profit. Find the selling price per egg.

Solution:

It is given that

C.P. of one dozen eggs = 12 eggs = ₹ 18

Profit = 15%

We know that

S.P. of 12 eggs = [1 + 50/ 100] of ₹ 18

It can be written as

= (150/100 × 18)

By further calculation

= (3/2 × 18)

So we get

= 3 × 9

= ₹ 27

S.P. of 1 egg = ₹ 27/12

So we get

= ₹ 9/4

= ₹ 2.25

Question 13.

Mr Ghosh purchased wristwatches worth ₹60000. He sold one–third of them at a profit of 30%, one–third at a profit of 20% and remaining at a loss of 5%. Calculate his overall profit or loss percentage.

Solution:

C.P. of wristwatches = ₹60000

C.P. of $\frac{1}{3}$rd of wrist watches

$$= ₹\frac{1}{3} \times 60000 = ₹20000$$

C.P. of $\frac{1}{3}$rd of wrist watches

$$= ₹\frac{1}{3} \times 60000 = ₹20000$$

Remaining part of wrist watches

$$= 1 - \left(\frac{1}{3} + \frac{1}{3}\right) = 1 - \frac{2}{3} = \frac{1}{3}$$

$\therefore$ C.P. of remaining $\frac{1}{3}$rd of wrist watches

$$= ₹\frac{1}{3} \times 60000 = ₹20000$$

Now $\frac{1}{3}$rd of wrist watches sells at a profit of 30%

Then selling price of $\frac{1}{3}$rd of wrist watches

$= ₹\left(1+\frac{30}{100}\right) \times 20000$

$= ₹\left(\frac{100+30}{100}\right) \times 20000$

$= ₹\frac{130}{100} \times 20000 = ₹130 \times 200$

$= ₹26000$

Also $\frac{1}{3}$rd of wrist watches sells at a Profit of 20%, then selling price of $\frac{1}{3}$rd of wrist watches

$= ₹\left(1+\frac{20}{100}\right)$ of 20000

$= ₹\left(\frac{100+20}{100}\right) \times 20000$

$= ₹\frac{120}{100} \times 20000 = ₹120 \times 200$

$= ₹24000$

Remaining $\frac{1}{3}$rd of wrist watches sells at a loss of 5%, then selling price of $\frac{1}{3}$rd of wrist watches

$= ₹\left(1-\frac{5}{100}\right)$ of 20000

$$= ₹\left(1-\frac{5}{100}\right) \text{ of } 20000$$

$$= ₹\left(\frac{100-5}{100}\right) \times 20000$$

$$= ₹\frac{95}{100} \times 20000$$

$$= ₹95 \times 200 = ₹19000$$

S.P. of whole wrist watches

$$= ₹26000 + ₹24000 + ₹19000$$

$$= ₹69000$$

Profit = S.P. – C.P.

$$= ₹69000 - ₹60000 = ₹9000$$

$$\text{Profit \%} = \left(\frac{\text{Profit}}{\text{C.P.}} \times 100\right)\%$$

$$= \left(\frac{9000}{60000} \times 100\right)\%$$

$$= \left(\frac{9}{60} \times 100\right)\%$$

$$= \left(\frac{9}{3} \times 5\right)\% = 3 \times 5\% = 15\%$$

Hence Profit = 15 %

Question 14.

A laptop and a mobile phone were bought for ₹40000 and ₹24000 respectively. The shopkeeper made a profit of 8% on the laptop and a loss of 12% on the mobile phone. Find his gain or loss per cent on the whole transaction.

Solution:

C.P. of laptop = ₹40000

and C.P. of mobile phone = ₹24000

Profit on laptop = 8%

and loss on mobile phone = 12%

$$\therefore \text{ S.P. of laptop} = \frac{\text{C.P.} \times (100 + \text{Profit}\%)}{100}$$

$$= ₹\frac{40000 \times (100 + 8)}{100}$$

$$= ₹\frac{40000 \times 108}{100} = ₹43200$$

and S.P. of mobile phone

$$= \frac{\text{C.P.} \times (100 - \text{Loss}\%)}{100}$$

$$= ₹\frac{24000 \times (100 - 12)}{100}$$

$$= ₹\frac{24000 \times 88}{100} = ₹21120$$

Total cost = ₹40000 + ₹24000 = ₹64000

and Total S.P. = ₹43200 + ₹21120 = ₹64320

∴ Gain = S.P. − C.P. = ₹64320 − ₹64000 = ₹320

∴ Gain % = $\frac{Gain \times 100}{C.P.}$

= $\frac{320 \times 100}{64000} = \frac{1}{2}\% = 0.5\%$

Question 15.

Salman bought 40 chairs at ₹175 each fourth of them at a loss of 8%. At what price each must he sell the remaining chairs so as to gain 10% on the whole deal?

Solution:

C.P. of one chair = ₹175

C.P. of 40 chair = ₹175 × 40 = ₹7000

C.P. of $\frac{1}{4}$th of chairs *i.e.* 10 chairs

$$\left(\frac{1}{4} \times 40 = 10\right) = ₹\frac{1}{4} \times 7000 = ₹1750$$

Remaining chairs = 40 − 10 = 30

C.P. of 30 chairs = ₹7000 − ₹1750 = ₹5250

S.P. of 10 chairs

$$= ₹\left(1 - \frac{8}{100}\right) \text{ of } 1750$$

$$\therefore = ₹\left(\frac{100-8}{100}\right) \times 1750$$

$$= ₹\frac{92}{100} \times 1750$$

$$= ₹\frac{92}{10} \times 175 = ₹46 \times 35$$

$= ₹1610$

Salman want 10% gain on the whole deal

So selling price

$$= ₹\left(1+\frac{10}{100}\right) \text{ of } 7000$$

$$= ₹\frac{110}{100} \times 7000$$

$$= ₹110 \times 70 = ₹7700$$

Now selling price of remaining 30 chairs

$$= ₹7700 - ₹1610 = ₹6090$$

$$\text{Selling price of 1 chair} = ₹\frac{6090}{30} = ₹203$$

Question 16.

A shopkeeper sold two electronic gadgets for ₹44000 each. The shopkeeper made a loss of 12% on one and a profit of 10% on the other. Find his overall gain or loss.

Solution:

S.P. of first gadget = ₹44000

Loss = 12%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 - \text{Loss\%}} = ₹\frac{44000 \times 100}{100 - 12}$$

$$= ₹\frac{44000 \times 100}{88} = ₹50000$$

S.P. of the second gadget = ₹44000

Gain = 10%

$$\text{C.P.} = \frac{\text{S.P.} \times 100}{100 + \text{Gain\%}} = ₹\frac{44000 \times 100}{100 + 10}$$

$$= ₹\frac{44000 \times 100}{110} = ₹40000$$

Now S.P. of both gadgets = ₹44000 × 2 = ₹88000

Their cost price = ₹50000 + ₹40000 = ₹90000

∴ Loss = C.P. − S.P. = ₹90000 − ₹88000 = ₹2000

Overall loss = ₹2000

Question 17.

The manufacturing price of a T.V. set is ₹12000. The company sold it to a dealer at 20% profit and the dealer sold it to a customer at 12·5% profit. Find the price which the customer has to pay.

Solution:

The manufacturing price of a T.V. set = ₹12000

S.P. for company = $₹\left(1 + \frac{20}{100}\right) \times 12000$

$$= ₹\left(\frac{100+20}{100}\right) \times 12000$$

$$= ₹\frac{120}{100} \times 12000$$

$$= ₹120 \times 120 = ₹14400$$

i.e. **C.P. for dealer = ₹14400**

S.P. for dealer

$$= ₹\left(1+\frac{12.5}{100}\right) \times 14400$$

$$= ₹\left(\frac{100+12.5}{100}\right) \times 14400$$

$$= ₹\frac{112.5}{100} \times 14400$$

$= ₹112{\cdot}5 \times 144 = ₹16200$

Hence the Price the customer has to pay

$= ₹16200.$

Question 18.

Find the cost price, when :

(i) selling Price = ₹450, loss = 10%

(ii) selling Price = ₹690, profit = 15%

Solution:

(i) Selling price = ₹450, loss =10%

we know that,

$$\text{selling price} = \left(1 - \frac{10}{100}\right) \times \text{C.P.}$$

$$\Rightarrow 450 = \left(1 - \frac{10}{100}\right) \times \text{C.P.}$$

$$\Rightarrow 450 = \frac{90}{100} \times \text{C.P.}$$

$$\Rightarrow \text{C.P.} = ₹\frac{450 \times 100}{90}$$

$\therefore$ C.P. = ₹5 × 100 = ₹500

(ii) Selling price = ₹690, Profit = 15%

We know that,

$$\text{Selling price} = \left(1 + \frac{15}{100}\right) \times \text{C.P.}$$

$$\Rightarrow 690 = \frac{115}{100} \times \text{C.P.}$$

$$\Rightarrow \text{C.P.} = ₹\frac{690 \times 100}{115}$$

$\Rightarrow$ C.P. = ₹6 × 100 = ₹600

Question 19.

By selling an almirah for ₹3920, a shopkeeper would gain 12%. If it is sold for ₹4375, find his gain or loss, percentage.

Solution:

When Selling price of almirah = ₹3920

and Gain % = 12%

then C.P. =?

We know that,

$$\text{Selling Price} = \left(1 + \frac{12}{100}\right) \text{of C.P.}$$

$$\Rightarrow ₹3920 = \left(\frac{100+12}{100}\right) \text{of C.P.}$$

$$\Rightarrow ₹3920 = \frac{112}{100} \times \text{C.P.}$$

$$\Rightarrow \text{C.P.} = ₹\frac{3920}{112} \times 100$$

$$= ₹35 \times 100 = ₹3500$$

Now when C.P. of almirah = ₹3500

and S.P. of almirah = ₹4375

gain = S.P. – C.P. = ₹4375 – ₹3500 = ₹875

$$\text{gain\%} = \left(\frac{\text{gain}}{\text{C.P.}} \times 100\right)\%$$

$$= \left(\frac{875}{3500} \times 100\right)\% = \frac{875}{35}\% = 25\%$$

Question 20.

By selling a bicycle at ₹1334, a shopkeeper would suffer a loss of 8%. At how much amount should he sell it to make a profit of $12\frac{1}{2}\%$?

Solution:

When selling price of bicycle = ₹1334

Loss % = 8%

C.P. = ?

We know that,

Selling price = (1 – loss%) of C.P.

$$\Rightarrow ₹1334 = \left(1-\frac{8}{100}\right) \times \text{C.P.}$$

$$\Rightarrow ₹1334 = \frac{92}{100} \times \text{C.P.}$$

$$\Rightarrow \text{C.P.} = ₹\frac{1334}{92} \times 100$$

$$\Rightarrow \text{C.P.} = ₹\frac{1334}{23} \times 25$$

$$\Rightarrow \text{C.P.} = ₹58 \times 25 = ₹1450$$

Now C.P. = ₹1450

and Profit $= 12\frac{1}{2}\% = \frac{25}{2}\%$

$$\text{S.P.} = \left(1+\frac{25}{2\times 100}\right) \times \text{C.P.}$$

$$\Rightarrow \text{S.P.} = \left(1+\frac{25}{2\times 100}\right) \times (₹1450)$$

$$\Rightarrow \text{S.P.} = ₹\left(1+\frac{1}{8}\right) \times 1450$$

$$\Rightarrow \text{S.P.} = ₹\frac{9}{8} \times 1450$$

$$= ₹9 \times 181{\cdot}25 = ₹1631{\cdot}25$$

Question 21.

By selling a tie for ₹252, a shopkeeper gains 5%. At what price should he sell the tie to gain 35% ?

Solution:

Selling price of tie = ₹252

gain% = 5%

C.P. = ?

We know that,

Selling price = (1 + Gain %) of C.P.

$$\Rightarrow ₹252 = (1 + 5\%) \text{ of C.P.}$$

$$\Rightarrow ₹252 = \left(1 + \frac{5}{100}\right) \times \text{C.P.}$$

$$\Rightarrow ₹252 = \left(\frac{100 + 5}{100}\right) \times \text{C.P.}$$

$$\Rightarrow ₹252 = \frac{105}{100} \times \text{C.P.}$$

$$\Rightarrow \text{C.P.} = ₹\frac{252}{105} \times 100$$

$$\Rightarrow \text{C.P.} = ₹\frac{252}{21} \times 20$$

⇒ C.P. = ₹12 × 20 = ₹240

Now C.P. = ₹240

If shopkeeper wants a gain of 35%,

then Selling price = (1 + gain %) of C.P.

$$\text{S.P.} = ₹\left(1+\frac{35}{100}\right) \times \text{C.P.}$$

$$\text{S.P.} = ₹\left(\frac{135}{100}\right) \times 240$$

$$\text{S.P.} = ₹\frac{135}{5} \times 12$$

$$\text{S.P.} = ₹27 \times 12 = ₹324$$

Question 22.

A shopkeeper sells a bag at a 12% profit. If he had sold it for ₹39 more, he would have made 18% profit. Find the cost price of the bag for the shopkeeper.

Solution:

First time gain = 12%

and second time gain = 18%

∴ Difference in gain % = 18 – 12 = 6%

Actual difference = ₹39

If gain is ₹6, then C.P. = ₹100

and if gain is ₹1, then C.P. = $\frac{100}{6}$

and if gain is ₹39. then C.P. = ₹ $\frac{100\times39}{6}$ = ₹650

$$\text{S.P.} = \left(1-\frac{5}{100}\right) \text{ of } ₹\, x$$

$$= \frac{95}{100} \text{ of } ₹\, x = \frac{95}{20} \text{ of } ₹\, x$$

$$= ₹\frac{19x}{20}$$

To obtained 15% Profit,

$$\text{S.P.} = \left(1+\frac{15}{100}\right) \text{ of } ₹\, x$$

$$= \frac{115}{100} \text{ of } ₹\, x$$

$$= \frac{23}{20} \text{ of } ₹\, x = ₹\frac{23x}{20}$$

According to given condition,

$$\frac{23x}{20} = \frac{19x}{20} + 260$$

$$\Rightarrow \frac{23x}{20} - \frac{19x}{20} = 260$$

$$\Rightarrow \frac{23x-19x}{20} = 260$$

$$\Rightarrow \frac{4x}{20} = 260$$

$$\Rightarrow \frac{x}{5} = 260$$

$$\Rightarrow x = 260 \times 5$$

$$\therefore x = 1300$$

Hence the cost price of sweater = ₹1300

Question 24.
Janki sold her leather purse at 8% loss. If she had sold it for ₹ 150 more, she would have made 12% profit. Find the selling price of the purse.
Solution:
Let the selling price leather purse = ₹ x
Loss = 8%

$$\therefore \ ₹x = \left(1 - \frac{8}{100}\right) \text{ of C.P.}$$

$$\left\{\because \text{S.P.} = \left(1 - \frac{l}{100}\right) \text{ of C.P.}\right\}$$

$$\Rightarrow ₹x = \frac{92}{100} \text{ of C.P.}$$

$$\Rightarrow \text{C.P.} = ₹x \times \frac{100}{92} = \frac{100x}{92}$$

To make 12% Profit

$$\text{S.P.} = \left(1 + \frac{12}{100}\right) \text{ of C.P.}$$

$$= ₹\frac{112}{100} \times \frac{100x}{92} = ₹\frac{112x}{92}$$

According to given condition,

$$\Rightarrow \frac{112x}{92} = x + 150$$

$$\Rightarrow \frac{112x}{92} - x = 150$$

$$\Rightarrow \frac{112x - 92x}{92} = 150 \Rightarrow \frac{20x}{92} = 150$$

$$\Rightarrow x = \frac{150 \times 92}{20} = \frac{15 \times 92}{2} = 15 \times 46 = 690$$

Hence the selling price of leather purse = ₹690