10. Profit and Loss

Let us Work Out 10.1

1. Question

Let us fill up the following table:

Cost price	Selling price	Profit/loss	Percentage profit/loss
Rs. 500			Profit is 25
Rs. 300			Loss is 7
Rs. 1250			Loss is 8
	Rs. 23000		Profit is 15

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Profit = Selling price – Cost price

Loss = Cost price – Selling price

(1). Cost price = Rs. 500 Profit %= 25

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

$25 = \frac{\text{Profit}}{500} \times 100$

Profit = 25×5= Rs. 125

Selling price = Cost price + Profit

Selling price = Rs. 500 + Rs. 125 = Rs. 625

(2). Cost price = Rs. 300 Loss %= 7

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

$7 = \frac{\text{Loss}}{300} \times 100$

Loss = 7×3= Rs. 21

Selling price = Cost price – Loss

Selling price = Rs. 300 – Rs. 21 = Rs. 279

(3). Cost price = Rs. 1250 Loss %= 8

$$\text{Loss/profit percent} = \frac{\text{total profit/loss}}{\text{cost price}} \times 100$$

$$8 = \frac{\text{Loss}}{1250} \times 100$$

Loss = 2×50= Rs. 100

Selling price = Cost price – Loss

Selling price = Rs. 1250 – Rs. 100 = Rs. 1150

(4). Selling price = Rs. 23000 Profit %= 15

$$\text{Loss/profit percent} = \frac{\text{total profit/loss}}{\text{cost price}} \times 100$$

$$15 = \frac{\text{Profit}}{x} \times 100$$

$$\text{Profit} = \text{Rs.}\ \frac{15x}{100}$$

Selling price = Cost price + Profit

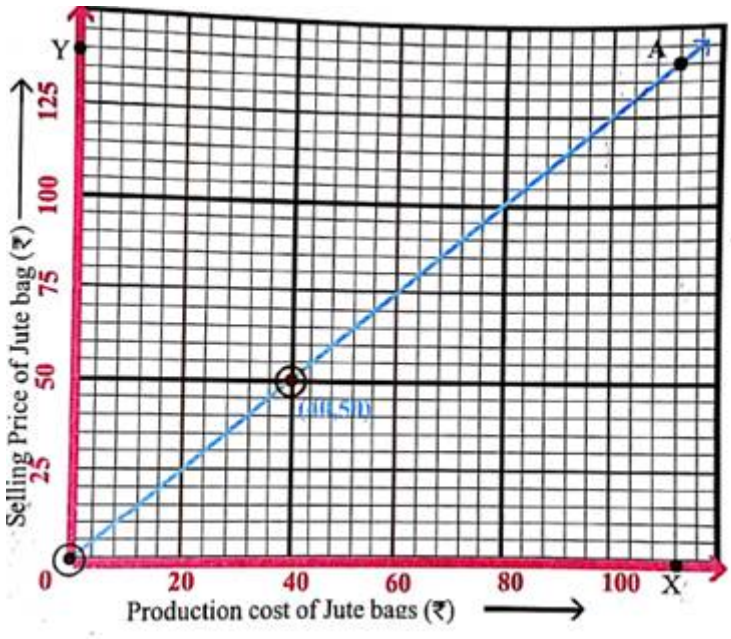
$$\text{Rs. } 23000 = \text{Rs. } x + \text{Rs. } \frac{15x}{100} = \text{Rs. } \frac{115x}{100}$$

x = 20000

$$\text{Profit} = \frac{15 \times 20000}{100} = 3000$$

2. Question

From the graph, let us find out the answers of the following questions:



(a) Let us write the relation between cost price and selling price by observing the graph.

(b) Let us write the selling price if the production cost of the jute bag is Rs. 60

(c) Let us write the production cost if the selling price of the jute bag is Rs. 125 by observing the graph.

(d) Let us calculate and write the percentage profit/loss from the graph.

(e) Let us write the percentage profit/loss on selling price from the graph.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

(a). If we take point (40,50)

We get

$40y = 50x$

$4y \times 10 = 5x \times 10$

$\therefore y = \frac{5}{4} \times x$

(b). If productive cost of jute is Rs. 60

Then $x = 60$

$y = \frac{5}{4} \times 60$

$y = \frac{60 \times 5}{4}$=Rs. 75

(c). By watching graph

We can see that having y =Rs. 125

Where line crosses at point having x = Rs. 100

∴ Cost price will be Rs. 100

(d). For writing Profit %

Let's take point (40,50)

Where cost price = Rs. 40

Profit = Selling price – Cost price

= 50 – 40 = 10

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Profit % = $\frac{10}{40} \times 100$

=25%

(e). For writing Profit % on selling price

Let's take point (40,50)

Where cost price = Rs. 40

Profit = Selling price – Cost price

= 50 – 40 = 10

Loss/profit percent on selling price = $\frac{\text{total profit/loss}}{\text{Selling price}} \times 100$

Profit % on selling price= $\frac{10}{50} \times 100$

=20%

3. Question

Subir uncle has sold a clock at the price Rs. 176. If the loss of Subir uncle is 12% by selling the clock. Let us calculate and observe that with how much money he has bought the clock.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

$12 = \frac{\text{Cost price} - \text{Selling price}}{\text{Cost price}} \times 100$

$12 = \frac{x-176}{x} \times 100$

$12x = 100x - 17600$

$88x = 17600$

$x = \frac{17600}{88} = 200$

∴ Cost price of clock was Rs. 200

4. Question

Anoarabibi has sold each dozen lemons at Rs. 42 by buying 10 lemons at Rs. 30. Let us calculate and observe the percentage profit or loss Anoarabibi has made.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Cost price of 10 lemons = Rs. 30

Cost price of 1 lemons = Rs. 3

Selling price of 12 lemons = Rs. 42

Selling price of 1 lemons = Rs. $\frac{42}{12}$ = Rs. 3.5

Total profit = Selling price – Cost price

=3.5 – 3 = 0.5

profit percent = $\frac{\text{total profit}}{\text{cost price}} \times 100$

$= \frac{0.5}{3} \times 100$

$= 16\frac{2}{3}\%$

5. Question

Amalbabu sold a picture at 20% loss. But the made a profit of 5% if he sold it with Rs. 200 more. Let us calculate and observe the cost price of the picture he has bought.

Answer

Formula Used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Let Cost price of picture be X

Then Selling price = Cost price – Loss

$= X - \frac{20}{100} \times X$

$= \frac{80x}{100}$

If he sold it with Rs. 200 more than

$\frac{80x}{100}$ + Rs. 200

He made 5% profit

Selling price = Cost price + Profit

$= X + \frac{5X}{100}$

$= \frac{105X}{100}$

$\Rightarrow \frac{80x}{100}$ + Rs. 200 = $\frac{105x}{100}$

$\frac{105x-80x}{100}$ = Rs. 200

$\frac{25x}{100}$ = Rs. 200

X = Rs. 800

6. Question

Supriya has bought a clock. If she sells the clock at Rs. 370, her profit will be equal to the loss for selling it at Rs. 210. Let us calculate and write the cost price of the clock.

Answer

Let the cost price be X

Profit = Selling price – Cost price

Profit = Rs. 370 – X

Loss = Cost price – Selling price

Loss = X – Rs. 210

If profit = loss

Then;

Rs. 370 – X = X – Rs. 210

X+X = Rs. 370 + Rs. 210

2X = Rs. 580

X = $\text{Rs.}\frac{580}{2}$ = Rs. 290

7. Question

My elder sister has bought an umbrella from Arun uncle's shop at Rs. 255. If Arun uncle gave 15% discount on the market price, then let us write after calculation the market price of the umbrella.

Answer

Formula Used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Let the market price be X

Then;

15% discount on market price is

X - $\frac{15X}{100} = \frac{85X}{100}$

Sold at Rs. 255

Rs. 255 = $\frac{85X}{100}$

X = Rs. 300

∴ Market price of umbrella is Rs. 300

8. Question

My friend has bought a story book at 25% discount on written price. If he sells the book at written price then let us write the profit percentage after calculation.

Answer

Formula Used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Let the written price be X.

If he avail 25% discount

Then;

$X - \frac{25X}{100} = \frac{100X-25X}{100} = \frac{75X}{100} = \frac{3X}{4}$

If he sells at written price

Then;

Selling price is X

Cost price is $\frac{3X}{4}$

Profit = Selling price – Cost price

$= X - \frac{3X}{4} = \frac{4X-3X}{4} = \frac{X}{4}$

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

$= \frac{\frac{X}{4}}{\frac{3X}{4}} \times 100\%$

$= \frac{100}{3}\%$

$= 33\frac{1}{3}\%$

9. Question

Niyamotchacha has bought 150 eggs at the rate of Rs. 5 each. But after bringing to the shop, he saw that 8 eggs are broken and 7 eggs are rotten. If he sells each egg at Rs. 6, then what will be the profit/loss percentage of Niyamotchacha — let us calculate and write.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100$

Cost price of 1 egg = Rs. 5

Cost price of 150 egg = Rs. 5×150 = Rs. 750

If 8 eggs are broken and 7 eggs are rotten

Remaining eggs are 150 – 8 – 7=135

Selling price of 1 egg = Rs. 6

Selling price of 135 eggs= Rs. 6×135 = Rs. 810

Profit = Selling price – Cost price

= Rs. 810 – Rs. 750

= Rs. 60

profit percent = $\frac{\text{total profit}}{\text{cost price}} \times 100\%$

= $\frac{\text{Rs } 60}{\text{Rs } 750} \times 100\%$

= 8 %

10. Question

Asifchacha sold a toy at 5% profit. If the cost price of the toy is less by 20% and selling price is less by Rs. 34, then Asifchacha would make a 10% profit. Let us calculate the cost price of the toy.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

Let the cost price be X

Then;

Selling price = $X+\frac{5X}{100} = \frac{100X+5X}{100} = \frac{105X}{100} = \frac{21X}{20}$

If cost price is less by 20%

Then;

$X - \frac{20X}{100} = \frac{100X-20X}{100} = \frac{80X}{100} = \frac{4X}{5}$

And selling price is less by Rs. 34

$\frac{21X}{20}$ – Rs. 34 = $\frac{21X-680}{20}$

Profit = Selling price – Cost price

$= \frac{21X-680}{20} - \frac{4X}{5} = \frac{21X-680-16X}{20} = \frac{5X-680}{20} = \frac{X-135}{4}$

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

$10\% = \frac{\frac{X-135}{4}}{\frac{4X}{5}} \times 100\%$

$\frac{1}{10} = \frac{5\times(X-135)}{4\times4X}$

$16X = 50X - 6800$

$34X = 6800$

$X = \frac{6800}{34} = 200$

∴ Cost price of toy is Rs. 200.

11. Question

There is a loss of 4% by selling 12 commodities at Rs. 1. To make 44% profit how money commodities have to be sold at Rs. 1?

Answer

Formula Used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

If selling price of 12 commodities = Rs. 1

If selling price of 1 commodities = Rs. $\frac{1}{12}$

Let Cost price of 1 commodity be X

⇒ Loss = Cost price – Selling price

$= X - \frac{1}{12} = \frac{12X-1}{12}$

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

$4\% = \frac{\frac{12X-1}{12}}{X} \times 100$

$1 = \frac{12X-1}{12X} \times 25$

$12X = 300X - 25$

$288X = 25$

$X = \frac{25}{288}$

For 44 % profit

Selling price = Cost price + Profit

Selling price = $X+\frac{44}{100}\times X$

$= \frac{100X+44X}{100} = \frac{144X}{100} = \frac{144}{100} \times \frac{25}{288} = \frac{1}{8}$

Selling price of 1 commodity = Rs. $\frac{1}{8}$

Selling price of 8 commodity = Rs. $\frac{1}{8}\times 8$ = Rs. 1

∴ 8 commodities should be sold in Rs. 1 for 44% profit

12. Question

By producing two sharis, Rama aunti sold one shari at 15% profit and another at 20% profit. She has made total profit by Rs. 262.50. If the ratios of production costs of two sharis is 1 : 3, what will be the production cost of each of the two sharis?

Answer

If the ratios of production costs of two sharis is 1 : 3

Then;

Let the production cost be X and 3X

If 1st shari makes 15% profit on productive cost

Then,

Profit = $\frac{15}{100} \times X = \frac{15X}{100}$

If 2nd shari makes 20% profit on productive cost

Then,

Profit = $\frac{20}{100} \times 3X = \frac{60X}{100}$

Total profit = $\frac{60X}{100} + \frac{15X}{100} = \frac{75X}{100} = \frac{3X}{4}$ = Rs. 262.5

3X= Rs. 262.5×4

3X= Rs. 1050

X = $\frac{Rs.1050}{3}$= Rs. 350

∴ Productive cost of 1st shari = Rs. 350

∴ Productive cost of 2nd shari = Rs. 350×3 = Rs. 1050

13. Question

One man bought some toffees at the rate of Rs. 2 for 15 pieces. He sold them at the rate of half of money for 5 pieces and at the rate of remaining half of money for 10 pieces. What will be his profit/loss percentage?

Answer

Cost price of 15 toffees is Rs. 2

Half of money is Rs. 1

He sold 5 toffees for Rs 1

He sold another 10 toffees for Rs. 1

∴ he sold 15 toffees for Rs. 2

Hence he bought at the same rate and sold them at same rate

Profit =0

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

= $\frac{0}{\text{Cost price}} \times 100 = 0\%$

∴ Neither Profit nor Loss.

14. Question

Afsarchacha made two wooden chair with same price and he put the market price for each chair as Rs. 1250. He made a profit of 15% by selling one chair at 8% discount. If he sold the second chair at Rs. 1120, then let us calculate his over-all percentage of profit.

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

If the market price of chair is Rs. 1250

By giving 8% discount

Selling price of chair comes to

$1250 - \frac{8}{100} \times 1250 = 1250[1 - \frac{8}{100}] = 1250[\frac{100-8}{100}]$

$= 1250 \times \frac{92}{100}$=Rs. 1150

When chair sold at Rs. 1150 profit of 15%is made

Then;

Let cost price of chair be X

Then selling price is

$X+\frac{15X}{100}=\frac{100X+15X}{100}=\frac{115X}{100}$

While selling price of each chair is Rs. 1150

$\frac{115X}{100}$=Rs. 1150

$X=\frac{1150\times100}{115}$ = Rs. 1000

Profit in 1st chair = 1150 – 1000 = 150

∴ Cost price of each chair is Rs. 1000

Profit in 2nd chair = 1120 – 1000 = 120

Overall profit = 150+120=270

Overall cost price = 1000+1000 = 2000

Overall Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}\times 100\%$

$=\frac{270}{2000}\times100 = 13.5\%$

∴ overall profit percent is 13.5 %

15. Question

The market price of a special type of pens is Rs. 36.50. By selling the pen to Shuvam with a discount of Rs. 2.90 Rafikchacha makes a profit of 12%. If he sold a pen of that type of Mita at Rs. 34.50, then let us find out his percentage profit in the second pen.

Answer

Formula sed.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}\times 100\%$

Market price of pen is Rs. 36.5

While selling to shuvam

Selling price = Rs. 36.5 – Rs. 2.9

= Rs. 33.6

Profit made by selling to shuvam is 12%

Let cost price of pen be X

Then;

Selling price will be

$X+\frac{12X}{100} = \frac{100X+12X}{100} = \frac{112X}{100}$

While selling price is Rs. 33.6

$\frac{112X}{100}$ = Rs. 33.6

X = $\text{Rs.}\frac{3360}{112}$ = Rs. 30

⇒ Cost price of pen is Rs. 30

While selling to Mita

Selling price = Rs. 34.5

Profit = Selling price – Cost price

= Rs. 34.5 – Rs. 30 = Rs. 4.5

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

$= \frac{\text{Rs.4.5}}{\text{Rs.30}} \times 100$

= 15%

∴ 15% profit is made while selling to Mita.

16. Question

A publisher expended Rs. 3, 875 for buying papers, Rs. 3,315 for printing and Rs. 810 for binding of 2000 copies books. He sold to book sellers and makes a profit 20% after giving discount of 20%. Let us determine the market price of each book.

Answer

Cost price of 2000 books = Rs.[3875+3315+810]

= Rs. 8000

Cost price of each book = $\text{Rs.}\frac{8000}{2000}$ = Rs. 4

For making 20% profit

Selling price = Cost price + Profit

= Rs. 4 + $\frac{20}{100}$×Rs. 4

= Rs. 4.8

For giving 20% discount on marked price

Let the marked price be X

Selling price = X - $\frac{20X}{100} = \frac{100X-20X}{100} = \frac{80X}{100} = \frac{4X}{5}$

Equating both we get

$\frac{4X}{5}$ = Rs. 4.8

X = Rs. $\frac{4.8\times5}{4}$ = Rs. 6

∴ Marked price of each book is Rs. 6

17. Question

Hasimabibi sold each of two handloom factories at Rs. 1248. She makes a profit of 4% for the first, but makes a loss of 4% for the 2nd. What is her overall profit or loss?

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}$× 100%

Selling price of each handloom = Rs. 1248

In case of 1st 4% profit is made

Let the cost price of handloom be X

Profit = Selling price – Cost price

= 1248 – X

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}$× 100%

4% = $\frac{1248-X}{X}$× 100%

4X = 124800 – 100X

100X+4X = 124800

104X = 124800

$X=\frac{124800}{104}$ = 1200

Profit = 1248 – 1200 = Rs. 48

In case of 2nd 4% loss is made

Let the cost price of handloom be Y

Loss = Cost price – Selling price

= X – 1248

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}\times$ 100%

4% = $\frac{X-1248}{X}\times$ 100%

4X = 100X - 124800

100X – 4X = 124800

96X = 124800

$X=\frac{124800}{96}$ = 1300

Loss = 1300 - 1248 = Rs. 52

Overall = Rs. 48 – Rs52 = – Rs. 4

∴ Overall loss of Rs. 4

18. Question

karim makes a loss of 19% by selling a mobile phone to Mohan at Rs. 4860. If Mohan sells to Rahim at the same price in which Karim sells to Mohan, then Karim makes a profit of 17%. What is the percentage profit of Mohan?

Answer

Formula used.

Loss/profit percent = $\frac{\text{total profit/loss}}{\text{cost price}}\times$ 100%

Selling price = Rs. 4860

Let Cost price be X

Then selling price = X – $\frac{19X}{100}$ = $\frac{100X-19X}{100}$ = $\frac{81X}{100}$

By equating both

$\frac{81X}{100}$ = Rs. 4860

X =Rs. 6000

If Mohan sells at 17% profit

$17\% = \frac{\text{total profit/loss}}{6000} \times 100\%$

Profit = 17× 60 = 1020

Total profit = 1020+1320 = 2340

$\text{Loss/profit percent} = \frac{\text{total profit/loss}}{\text{cost price}} \times 100\%$

$\text{Profit percent} = \frac{2340}{4680} \times 100\%$

= 50%

19. Question

Firojchacha got total Rs. 719.50 by selling a pant at 20% profit and shirt at 15% profit. If he would sell the pant at 25% profit and the shirt at 20% profit, then he would get Rs. 30.50 more. Let us calculate the cost prices of the pant and the shirt.

Answer

Let the cost price of shirt be X

Let the cost price of Pant be Y

selling a pant at 20% profit and shirt at 15% profit.

We get ;

$Y+\frac{20Y}{100}+X+\frac{15X}{100} = \frac{120Y+115X}{100}$ = Rs. 719.5

24Y+23X = 14390

selling a pant at 25% profit and shirt at 20% profit.

We get ;

$Y+\frac{25Y}{100}+X+\frac{20X}{100} = \frac{125Y+120X}{100}$ = Rs. 719.5+Rs. 30.5 = Rs. 750

25Y+24X = 15000

Subtracting 2^{nd} from 1^{st}

25Y+24X–24Y–23X = 15000 – 14390

X + Y = 610

X = 610 – Y

Placing value of X in 2nd eq

25Y + 24(610 – Y) = 15000

Y = 15000 – 14640 = Rs. 360

X = 610 – 360 =Rs. 250

∴ Cost price of pant is Rs. 360

∴ Cost price of shirt is Rs. 250

20. Question

Rabi uncle bought rice at Rs. 3000. He sold $\frac{1}{3}^{rd}$ part of rice at 20% loss and $\frac{2}{5}^{th}$ part of rice at 25% profit. At what percentage profit, the remaining part of rice is to be sold to get overall 10% profit.

Answer

Overall all profit = $\frac{10}{100}$×Rs. 3000

= Rs. 300

Cost price of $\frac{1}{3rd}$ part of rice = Rs. $\frac{3000}{3}$ = Rs. 1000

If he sells at 20% loss

Loss = $\frac{20}{100}$× Rs. 1000 = Rs. 200

Cost price of $\frac{2}{5}$ part of rice = Rs. $\frac{2\times3000}{5}$ = Rs. 1200

If he sells at 25% Profit

Profit = $\frac{25}{100}$× Rs. 1200 = Rs. Rs 300

Cost price of remaining part = Rs. [3000 – 1200 - 1000]

= Rs. 800

Let's say he sells at X% profit

Profit = $\frac{X}{100}$× Rs. 800 = Rs. 8X

⇒ Overall all profit = Rs. 300 – Rs. 200 + Rs. 8X

Rs. 300 = Rs. 100 + Rs. 8X

8X = 200

$X = \frac{200}{8} = 25\%$

∴ On remaining part 25% profit is to made for overall 10%.

21. Question

A trader by selling one kind of tea at Rs. 80/kg. makes a loss of 20% and makes a profit of 25% by selling another kind of tea at Rs. 200/kg. At what ratio these two types of tea should be mixed so that by selling it at Rs. 150/kg. the profit would be 25%?

Answer

If selling at Rs. 80/kg trader makes loss of 20%

Let the cost price be X

Then selling price $= X - \frac{20X}{100} = \frac{100X - 20X}{100} = \frac{80X}{100} = \frac{4X}{5}$

$\Rightarrow \frac{4X}{5} = \text{Rs } 80$

$X = \text{Rs.} \frac{80 \times 5}{4} = \text{Rs. } 100$

∴ Cost price 1st tea is Rs. 100

If selling at Rs. 200/kg trader makes profit of 25%

Let the cost price be Y

Then selling price $= Y + \frac{25Y}{100} = \frac{100Y + 25Y}{100} = \frac{125Y}{100} = \frac{5Y}{4}$

$\Rightarrow \frac{5X}{4} = \text{Rs } 200$

$X = \text{Rs.} \frac{200 \times 4}{5} = \text{Rs. } 160$

∴ Cost price 2nd tea is Rs. 160

If selling at Rs. 150/kg trader makes profit of 25%

Let the cost price be Z

Then selling price $= Z + \frac{25Z}{100} = \frac{100Z + 25Z}{100} = \frac{125Z}{100} = \frac{5Z}{4}$

$\Rightarrow \frac{5Z}{4} = \text{Rs } 150$

$Z = \text{Rs.} \frac{150 \times 4}{5} = \text{Rs. } 120$

∴ Cost price of mixed tea is Rs. 120

Let the amount of mixture of 1st tea be X

Then the amount of mixture of 2nd tea be 1 – X

X×100 + 160×(1-X) = 120

-60X = 120 – 160 = -40

$X = \frac{4}{6} = \frac{2}{3}$

$1 - X = 1 - \frac{2}{3} = \frac{1}{3}$

Therefore

The ratio = $\frac{2}{3} : \frac{1}{3}$ = 2:1

Let us Work Out 10.2

1. Question

Subalbabu of Antpur, by producing rice sells it to a wholesaler Sahanabibi at 20% profit. Sahanabibi sells that rice to the shopkeeper Utpalbabu at 10% profit. But if Utpalbabu sells this rice at 12% profit, then let us find out the answers of the following questions by drawing picture on a straight line:

(i) Subalbabu has spent Rs. 7500 to produce some amount of rice. Let us calculate and write it with how much money Sahanabibi has bought that amount of rice.

(ii) To produce the some amount of rice Subalbabu has spent Rs. 2500, with how much money Utpalbabu will sell that amount of rice —let us calculate and write it.

(iii) The price at which Utpalbabu sells rice to us, if Subalbabu sells directly at that price then what will be the profit percentage of Subalbabu —let us calculate and write it.

Answer

As Subalbabu takes profit of 20% on his sale when he sells it to wholesaler Sahanabibi

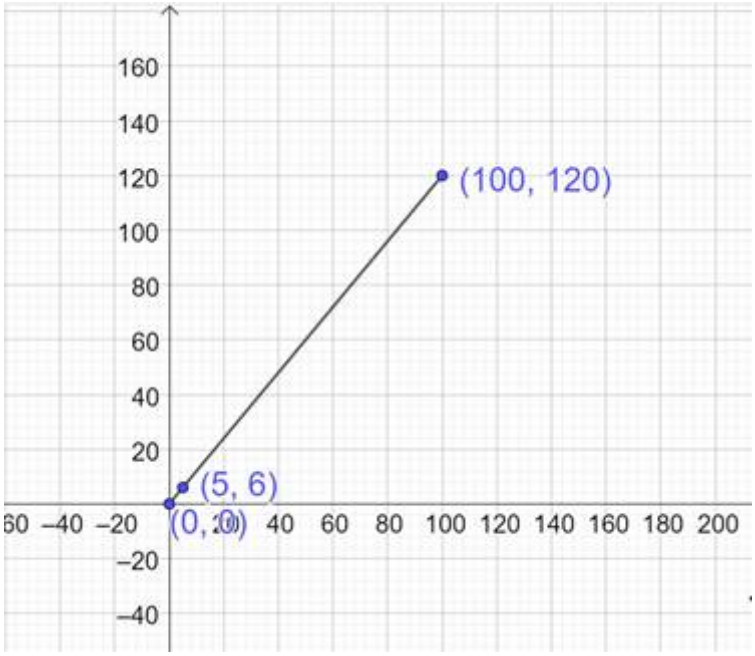
If cost of production is ₹ 100 then the selling price will be (100 + 20) = ₹ 120.

If cost of production is ₹1 then the selling price $= \frac{120}{100} = \frac{6}{5}$

If cost of production is ₹ ‘x’ then the selling price $= \frac{6x}{5}$

We will plot the graph between Cost price(x-axis) and Selling Price(y-axis) for Subalbabu.

Cost Price	0	5	100
Selling Price	0	6	120



(i) Given cost of production = ₹ 7500

Profit for Subalbabu = 20%

Selling price for Subalbabu = $7500 + 7500\left(\frac{20}{100}\right)$

$= 7500\left(1 + \frac{20}{100}\right) = 9000$

Cost price for Sahanabibi = Selling price for Subalbabu = ₹ 9000.

(ii) Cost price of production = ₹ 2500

Profit for Subalbabu = 20%

Selling price for Subalbabu = $2500 + 2500\left(\frac{20}{100}\right)$

$$= 2500\left(1 + \frac{20}{100}\right) = 3000$$

Cost price for Sahanabibi = Selling price for Subalbabu = ₹ 3000

Profit for Sahanabibi = 10%

Selling price for Sahanabibi = $3000 + 3000\left(\frac{10}{100}\right)$

$$= 3000\left(1 + \frac{10}{100}\right) = 3300$$

Cost price for Utpalbabu = Selling price for Sahanabibi = ₹ 3300

Profit for Utpalbabu = 12%

Selling price for Subalbabu = $3300 + 3300\left(\frac{12}{100}\right)$

$= 3300\left(1 + \frac{12}{100}\right) = 3696$

Final price for the buyer = 3696

So, Utpalbabu sells the rice for ₹ 3696.

(iii) As calculated in (ii), for the production price of₹ 2500, the final selling price to us is ₹ 3696.

Profit for Subalbabu if he sells directly at this price = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

Profit for Subalbabu if he sells directly at this price = $\frac{(3696-2500)}{2500} \times 100 = 47.84\%$

2. Question

In a market, at the time of selling jute bag, the producer, wholesaler and retailer make profits of 15%, 20% and 25% respectively. Now if a bag reaches to buyer through producer, wholesaler and retailer, then let us find out the answers of the following questions:

(i) Let us calculate and write the production cost of a bag which is bought by a buyer at Rs. 138.

(ii) Let us calculate and write the price of the bag at which the buyer will buy when its production cost is Rs. 140.

(iii) The bag which a retailer has bought at Rs. 98, let us calculate and write that how much money will be given by a buyer for that bag.

(iv) The bag which the wholesaler has bought at Rs. 175, let us calculate and write that how much money, a buyer will give to buy that bag.

(v) The bag which a buyer has bought at Rs. 276, if that bag would have been bought directly from the wholesaler then how much money would be saved let us calculate and write it.

Answer

Let the production cost of jute bag be ₹ x.

Now, Profit for producer = 15%

∴ Selling price of producer $= x + \frac{15}{100}x = x\left(1 + \frac{15}{100}\right)$

Cost price for wholesaler = selling price of producer $= x\left(1+\frac{15}{100}\right)$

Profit for wholesaler = 20%

∴ selling price of wholesaler$= x\left(1+\frac{15}{100}\right)+\frac{20}{100}x\left(1+\frac{15}{100}\right)$

$=x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)$

Cost price for retailer = selling price of wholesaler

$=x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)$

Profit for retailer = 25%

∴ selling price of retailer

$=x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)+\frac{25}{100}x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)$

$=x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)\left(1+\frac{25}{100}\right)$

(i) Let the production cost of jute bag be ₹ x.

After successive profits by producer, wholesaler and retailer,

The final price for the buyer $= ₹\, x\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)\left(1+\frac{25}{100}\right)$

= ₹ 1.725x

⇒ 1.725x = 138

⇒ x = 80

So, the production cost for the jute bag is ₹ 80.

(ii) Given the production cost of jute bag = ₹ 140

After successive profits by producer, wholesaler and retailer,

The final price for the buyer $= ₹\, 140\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)\left(1+\frac{25}{100}\right)$

= ₹ 241.5

(iii) The cost price for the retailer = ₹ 98

The profit retailer makes on the bag = 25%

The final price for the buyer $= 98+\frac{25}{100}(98)$

$= ₹\ 98\left(1+\frac{25}{100}\right) = ₹\ 122.5$

(iv) The cost price for the wholesaler = ₹ 175

The profit wholesaler makes on the bag = 20%

The successive profit retailer makes on the bag = 25%

The final price for the buyer $= ₹\ 175\left(1+\frac{20}{100}\right)\left(1+\frac{25}{100}\right) = ₹\ 262.5$

(v) The buying price of buyer = The selling price for the retailer = ₹ 276

Let the selling price of wholesaler be 'x'.

Now, as retailer makes 25% profit on wholesaler's price, therefore buyer's price will be

$$= x + \frac{25}{100}x = \frac{5}{4}x$$

$$\Rightarrow 276 = \frac{5}{4}x$$

$\Rightarrow 5x = 1104$

$\Rightarrow x = 220.8$

So, if buyer would have bought directly from wholesaler he would had a profit of (276 - 220.8 = 55.2 ₹)

3. Question

The production cost and the cost prices of a cycle at different levels are:

Production Cost (Rs.)	Cost Price of wholesaler (Rs.)	Cost Price of Retailer (Rs.)	Cost Price of Buyer (Rs.)
1050	1260	1449	1666.35

(i) Let us calculate, by selling cycle, how much profit percentage, the retailer has made.

(ii) Let us calculate and observe that by selling cycle, what the profit percentage, the wholesaler has made.

(iii) Let us calculate and write the profit percentage, that the producer has made by selling cycle.

(iv) Let us calculate and write that how much profit percentage has to be given more by a buyer than the production cost to buy a cycle.

(v) If a buyer buys a cycle directly from the producer and the producer has a profit of 30%, then how much money, the buyer will save — let us calculate

and write it.

Answer

(i) Cost price for retailer = ₹1449

Selling price for retailer = ₹1666.35

Profit of retailer = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

⇒ Profit of retailer = $\frac{(1666.35-1449)}{1449} \times 100 = 15\%$

(ii) Cost price for wholesaler = ₹1260

Selling price for wholesaler = ₹1449

Profit of wholesaler = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

⇒ Profit of wholesaler = $\frac{(1449-1260)}{1260} \times 100 = 15\%$

(iii) Cost price for producer = ₹1050

Selling price for producer = ₹1260

Profit of producer = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

⇒ Profit of producer = $\frac{(1260-1050)}{1050} \times 100 = 20\%$

(iv) Final selling price = ₹1666.35

Initial production cost = ₹1050

Total Profit percentage = $\frac{(1666.35-1050)}{1050} \times 100 = 58.7\%$

(v) The production cost of cycle = ₹ 1050

Profit for producer = 30%

Selling price of cycle $= 1050 + \frac{30}{100}(1050)$

$= 1050\left(1 + \frac{30}{100}\right)$ = ₹ 1365

The money buyer will save = ₹ (1666.35-1365) = ₹ 301.35

4 A. Question

The ratio of cost price and selling price is 10:11, the profit percentage is

A. 9

B. 11

C. $10\frac{1}{9}$

D. 10

Answer

Let the cost price be ₹10

The given ratio = $\frac{\text{Cost Price}}{\text{Selling Price}}$

$= \frac{10}{11}$

So, the selling price = $\left(\frac{11}{10}\right) \times 10$ = ₹ 11

Profit = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

$= \frac{(11 - 10)}{10} \times 100$

= 10 %

The correct option is (d).

4 B. Question

Buying a book at Rs. 40 and selling it at Rs. 60, the profit percentage will be

A. 50

B. $33\frac{1}{3}$

C. 20

D. 30

Answer

Cost price of book= ₹40

Selling price of book = ₹60

Profit = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

Profit = $\frac{(60-40)}{40} \times 100 = 50$ %

The correct option is (a).

4 C. Question

A shirt is sold at Rs. 360 and there is a loss of 10%. The cost price of the shirt is

A. Rs. 380

B. Rs. 400

C. Rs. 420

D. Rs. 450

Answer

Let the cost price of the shirt be ₹ x.

Loss percentage = 10 %

Selling price of shirt $= x\left(1-\frac{10}{100}\right)$ = 0.9x

⇒ 0.9x =360

⇒ x = (360/0.9) = 400

The correct option is (b)

4 D. Question

After 20% discount, the selling price of a geometry box becomes Rs. 48. The market price of the geometry box is

A. Rs. 60

B. Rs. 75

C. Rs. 80

D. Rs. 50

Answer

Let the market price of the geometry box be ₹ x.

Discount percentage = 20 %

Selling price of geometry box$= x\left(1-\frac{20}{100}\right)$ = 0.8x

⇒ 0.8x =48

$$\Rightarrow x = \left(\frac{48}{0.8}\right) = 60$$

The correct option is (a)

4 E. Question

A retailer buys medicine at 20% discount on marked price and sells to buyer at marked price. The retailer makes a profit percentage.

A. 20

B. 25

C. 10

D. 30

Answer

Let the market price of the medicine be ₹ x.

Discount percentage = 20 %

The cost price of medicine for retailer $= x\left(1 - \frac{20}{100}\right) = 0.8x$

The selling price of medicine for retailer = Market price = ₹ x

Profit = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

Profit = $\frac{(x - 0.8x)}{0.8x} \times 100 = 25\ \%$

5 A. Question

If 20% profit is on cost price, what is profit percentage on selling price?

Answer

Let the cost price be ₹ x

Profit on cost price = 20 %

Selling price $= x + \frac{20}{100}x$

$= x\left(1 + \frac{20}{100}\right) = 1.2x$

Profit on selling price = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Selling price}} \times 100$

Profit on selling price = $\frac{(1.2x - x)}{1.2x} \times 100 = 16.67\%$

5 B. Question

If 20% profit is on selling price, what is the profit percentage on cost price?

Answer

Let the selling price be ₹ x

Profit on selling price = 20 %

Cost price $= x + \frac{20}{100}x$

$= x\left(1 - \frac{20}{100}\right) = 0.8x$

Profit on cost price = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost price}} \times 100$

Profit on cost price = $\frac{(x - 0.8x)}{0.8x} \times 100 = 25\%$

5 C. Question

By selling 110 mangoes, if the cost price of 120 mangoes has been got, what will be the profit percentage?

Answer

Let the cost price of a mango be ₹ x

Cost price of 120 mangoes = ₹ 120x

Selling price of 110 mangoes = Cost price of 120 mangoes

Selling price of 1 mango = ₹ (120/110)x

Profit = $\frac{(\text{Selling Price} - \text{Cost Price})}{\text{Cost Price}} \times 100$

Profit = $\frac{\left(\frac{120x}{110} - x\right)}{x} \times 100 = 9.09\%$

5 D. Question

To submit electricity bill in due time, 15% discount can be obtained. Sumonbabu has got Rs. 54 as discount for submission of electricity bill in due time. How much was his electricity bill?

Answer

Let the electricity bill be ₹ x

Discount on the bill = 15%

Discount amount$= x\left(\frac{15}{100}\right) = 0.15x$

⇒ 0.15x=54

⇒ x = 360.

The amount of electricity bill was ₹ 360.

5 E. Question

A commodity is sold at Rs. 480 with a loss of 20% on selling price, what is the cost price of the commodity?

Answer

Let the cost price of the commodity be ₹ x.

Loss percentage = 20 %

Selling price of commodity $= x - \frac{20}{100}x$

$= x\left(1 - \frac{20}{100}\right) = 0.8x$

$\Rightarrow 0.8x = 480$

$\Rightarrow x = \left(\frac{480}{0.8}\right) = 600$

The cost price of the commodity was ₹600.

5 F. Question

If a commodity is sold with successive discounts of 20% and 10%, what will be the equivalent discount?

Answer

Let the market price be x.

First discount = 20%

Therefore, Price with first discount $= \left(x - \frac{20}{100}\right)$

$= x\left(1 - \frac{20}{100}\right)$

Second discount = 10%

Therefore, Selling price after successive discount

$= x\left(1 - \frac{20}{100}\right) - \frac{10}{100}x\left(1 - \frac{20}{100}\right)$

$= x\left(1 - \frac{20}{100}\right)\left(1 - \frac{10}{100}\right)$

$= x\left(\frac{8}{10}\right)\left(\frac{9}{10}\right) = 0.72x$

Equivalent discount = Percentage loss $= \frac{\text{Cost Price} - \text{selling Price}}{\text{Cost Price}} \times 100$

$$= \frac{x - 0.72x}{x} \times 100 = 28\%$$