

## EXERCISE 13.1

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**1. A student buys a pen for Rs 90 and sells it for Rs 100. Find his gain and gain percent.**

**Solution:**

We know that the cost price of pen = Rs 90

Selling price of pen = Rs 100

By using the formula,

Gain = selling price – cost price

$$= 100 - 90$$

$$= \text{Rs } 10$$

By using the formula,

Gain % = (gain/cost price)  $\times$  100

$$= (10/90) \times 100$$

$$= 100/9$$

$$= 11 \frac{1}{9} \%$$

**2. Rekha bought a saree for Rs 1240 and sold it for Rs 1147. Find her loss and loss percent.**

**Solution:**

We know that the cost price of saree = Rs 1240

Selling price of saree = Rs 1147

By using the formula,

Loss = cost price – selling price

$$= 1240 - 1147$$

$$= \text{Rs } 93$$

By using the formula,

Loss % = (loss/cost price)  $\times$  100

$$= (93/1240) \times 100$$

$$= 7.5 \%$$

**3. A boy buys 9 apples for Rs 9.60 and sells them at 11 for Rs 12. Find his gain or loss percent.**

**Solution:**

We know that the cost price of 9 apples = Rs 9.60

Cost price of 1 apple = Rs 9.60/9

Selling price of 11 apple = Rs 12

Selling price of 1 apple = Rs 12/11

By using the formula,

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$$\begin{aligned}\text{Gain} &= \text{selling price} - \text{cost price} \\ &= 12/11 - 9.60/9 \\ &= (108-105.60)/99 \\ &= \text{Rs } 2.40/99\end{aligned}$$

By using the formula,

$$\begin{aligned}\text{Gain \%} &= (\text{gain}/\text{cost price}) \times 100 \\ &= ((2.40/99)/(9.60/9)) \times 100 \\ &= 25/11 \\ &= 2\frac{3}{11}\%\end{aligned}$$

**4. The cost price of 10 articles is equal to the selling price of 9 articles. Find the profit percent.**

**Solution:**

We know that the cost price of 10 article = selling price of 9 article  
Let us consider CP of 1 article as Rs X

Selling price of 9 article = 10X

Selling price of 1 article = 10x/9

$$\begin{aligned}\text{Profit} &= 10x/9 - x \\ &= x/9\end{aligned}$$

$$\begin{aligned}\text{Profit \%} = \text{Gain \%} &= (\text{gain}/\text{cost price}) \times 100 \\ &= (x/9)/x \times 100 \\ &= 100/9 \\ &= 11\frac{1}{9}\%\end{aligned}$$

**5. A retailer buys a radio for Rs 225. His overhead expenses are Rs 15. If he sells the radio for Rs 300, determine his profit percent.**

**Solution:**

The cost price of a radio = Rs 225

Overhead expenses = Rs 15

Total cost = cost price + overhead expenses = 225+15 = Rs 240

Selling price of radio = Rs.300

By using the formula,

$$\begin{aligned}\text{Gain} &= \text{selling price} - \text{cost price} \\ &= 300 - 240 = \text{Rs } 60\end{aligned}$$

By using the formula,

$$\text{Gain \%} = (\text{gain}/\text{cost price}) \times 100$$

$$\begin{aligned} &= 60/240 \times 100 \\ &= 25\% \end{aligned}$$

**6. A retailer buys a cooler for Rs 1200 and overhead expenses on it are Rs 40. If he sells the cooler for Rs 1550, determine his profit percent.**

**Solution:**

We know the cost price of cooler = Rs 1200

Overhead expenses = Rs 40

Total cost = Rs 1200 + Rs 40 = Rs 1240

Selling price of cooler = Rs 1550

By using the formula,

$$\begin{aligned} \text{Gain} &= \text{selling price} - \text{cost price} \\ &= \text{Rs } 1550 - \text{Rs } 1240 \\ &= \text{Rs } 310 \end{aligned}$$

By using the formula,

$$\begin{aligned} \text{Gain \%} &= (\text{gain/cost price}) \times 100 \\ &= 310/1240 \times 100 \\ &= 25\% \end{aligned}$$

**7. A dealer buys a wristwatch for Rs 225 and spends Rs 15 on its repairs. If he sells the same for Rs 300, find his profit percent.**

**Solution:**

We know the cost price of wrist watch = Rs 225

Cost of repairing = Rs 15

Total cost = Rs 225 + Rs 15 = Rs 240

Selling price of watch = Rs 300

By using the formula,

$$\begin{aligned} \text{Gain} &= \text{selling price} - \text{cost price} \\ &= \text{Rs } 300 - \text{Rs } 240 \\ &= \text{Rs } 60 \end{aligned}$$

By using the formula,

$$\begin{aligned} \text{Gain \%} &= (\text{gain/cost price}) \times 100 \\ &= 60/240 \times 100 \\ &= 25\% \end{aligned}$$

**8. Ramesh bought two boxes for Rs 1300. He sold one box at a profit of 20% and the other box at a loss of 12%. If the selling price of both boxes is the same, find the cost price of each box.**

**Solution:**

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We know the cost price of two boxes = Rs 1300  
So let us consider cost price of one box be Rs x  
Cost price of other box = Rs 1300 – x

$$\begin{aligned}\text{Selling price of first box} &= x + x \times 20/100 \\ &= x + x/5 \\ &= \text{Rs } 6x/5\end{aligned}$$

$$\begin{aligned}\text{Selling price of second box} &= (1300 - x) - (1300 - x) \times 12/100 \\ &= \text{Rs } (28600 - 22x)/25\end{aligned}$$

By equating SP of first and second box we get,

$$6x/5 = (28600 - 22x)/25$$

$$150x = 28600 \times 5 - 110x$$

$$150x + 110x = 28600 \times 5$$

$$260x = 28600 \times 5$$

$$x = (28600 \times 5)/260$$

$$= 550$$

∴ Cost price of first box = Rs. 550

Cost price of second box = Rs 1300 – Rs 550 = Rs 750

**9. If the selling price of 10 pens is equal to cost price of 14 pens, find the gain percent.**

**Solution:**

Given that, Selling price of 10 pens = cost price of 14 pens

So, let the cost price of 1 pen be Rs x

Selling price of 10 pens = Rs 14x

Selling price of 1 pen = Rs 14x/10

By using the formula,

Gain = selling price – cost price

$$= 14x/10 - x$$

$$= 4x/10$$

By using the formula,

$$\text{Gain \%} = (\text{gain/cost price}) \times 100$$

$$= (4x/10)/x \times 100$$

$$= 2/5 \times 100$$

$$= 40\%$$

**10. If the selling price of 18 chairs be equal to selling price of 16 chairs, find the gain or loss percent.**

**Solution:**

Given that, Cost price of 18 chairs = selling price of 16 chairs

So, let the cost price of 1 chair be Rs  $x$

Selling price of 16 chairs = Rs  $18x$

Selling price of 1 chair = Rs  $18x/16$

By using the formula,

Gain = selling price – cost price

$$= 18x/16 - x$$

$$= 2x/16$$

$$= \text{Rs } x/8$$

By using the formula,

Gain % = (gain/cost price)  $\times$  100

$$= (x/8)/x \times 100$$

$$= 25/2$$

$$= 12 \frac{1}{2} \%$$

**11. If the selling price of 18 oranges is equal to the cost price of 16 oranges, find the loss percent.**

**Solution:**

Given that, Selling price of 18 oranges = cost price of 16 oranges

So, let the cost price of 1 orange be Rs  $x$

Selling price of 18 oranges = Rs  $16x$

Selling price of 1 orange = Rs  $16x/18$

By using the formula,

Loss = cost price – selling price

$$= x - 16x/18$$

$$= 2x/18$$

$$= \text{Rs } x/9$$

By using the formula,

Loss % = (loss/cost price)  $\times$  100

$$= (x/9)/x \times 100$$

$$= 100/9$$

$$= 11 \frac{1}{9} \%$$

**12. Ravish sold his motorcycle to Vineet at a loss of 28%. Vineet spent Rs 1680 on its repairs and sold the motor cycle to Rahul for Rs 35910, thereby making a profit of 12.5%, find the cost price of the motor cycle for Ravish.**

**Solution:**

Let us consider the cost price of motorcycle for Ravish be Rs  $x$



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Loss% for Ravish = 28%

Selling price for Ravish =  $x - x \times 28/100 = (100x - 28x)/100 = 72x/100$   
= Rs  $18x/25$

Selling price for Ravish = cost price for Vineet = Rs  $18x/25$

Repair cost by Vineet = Rs 1680

Total cost price of the motorcycle for Vineet = Rs  $18x/25 + Rs 1680$

Selling price for Vineet = Rs 35910

Profit =  $35910 - (18x + 42000)/25$   
= Rs  $(855750 - 18x)/25$

Profit % = 12.5% (Given)

By using the formula,

$$\begin{aligned}\text{Gain \%} &= (\text{gain/cost price}) \times 100 \\ \Rightarrow [(855750 - 18x)/25] / [(18x + 42000)/25] \times 100 &= 12.5 \\ \Rightarrow [(855750 - 18x)/25] \times [25/(18x + 42000)] &= 125/1000 \\ \Rightarrow (855750 - 18x) / (18x + 42000) &= 1/8 \\ \Rightarrow \text{By cross multiplying we get} \\ \Rightarrow 8(855750 - 18x) &= (18x + 42000) \\ \Rightarrow 6846000 - 144x &= 18x + 42000 \\ \Rightarrow 6846000 - 42000 &= 18x + 144x \\ \Rightarrow 162x &= 6804000 \\ x &= 6804000/162 \\ &= 42000\end{aligned}$$

$\therefore$  Cost price of motorcycle for Ravish = Rs 42000

**13. By selling a book for Rs 258, a bookseller gains 20%. For how much should he sell it to gain 30%?**

**Solution:**

Given details are,

Selling price of book is = Rs 258

The man's gain percent is = 20% of 100 = 20/100

So, let us consider the cost price of book be Rs x

By solving,

$$x + x \times 20/100 = 258$$

$$x + x/5 = 258$$

$$(5x + x)/5 = 258$$

By cross multiplying

$$6x = 5 \times 258$$

$$x = 1290/6$$

$$= 215$$

Now, the cost price of book is = Rs 215

For a gain of 30% the man should sell the book at =  $215 + 215 \times 30/100$

$$= 215 + 64.5$$

$$= 279.50$$

$\therefore$  To gain 30% the man should sell the book at Rs 279.50

**14. A defective briefcase costing Rs 800 is being sold at a loss of 8%. If the price is further reduced by 5%, find its selling price.**

**Solution:**

Given, cost price of the defective briefcase is = Rs. 800

The loss percent is = 8% of 100 = 8/100

Selling price of briefcase is =  $800 - 800 \times 8/100$

$$= 800 - 64$$

$$= \text{Rs } 736$$

When the price is further reduced by 5% (Given) = 5% of 100 = 5/100

New selling price =  $736 - 736 \times 5/100$

$$= 736 - 36.8$$

$$= \text{Rs } 699.2$$

$\therefore$  The selling price of the defective briefcase is Rs 699.2

**15. By selling 90 ball pens for Rs 160 a person loses 20%. How many ball pens should be sold for Rs 96 so as to have profit of 20%?**

**Solution:**

Given, selling price for 90 ball pens is = Rs 160

Selling price of 1 ball pen =  $\text{Rs } 160/90 = \text{Rs } 16/9$

The loss percent is = 20% of 100 = 20/100

Let us consider the cost price of 1 pen be Rs x

By solving,

$$x - x \times 20/100 = 16/9$$

$$x - x/5 = 16/9$$

$$(5x - x)/5 = 16/9$$

$$4x/5 = 16/9$$

By cross multiplying

$$4x \times 9 = 16 \times 5$$

$$36x = 80$$

$$x = 80/36$$

$$= \text{Rs } 20/9$$

Now, cost price of 1 ball pen = Rs 20/9

To get a profit of 20%...

Let us consider the number of pens be 'x'

So, selling price of 'x' pens is = Rs 96

Selling price of 1 pen is = Rs 96/x

We know that,

$$\text{Gain \%} = (\text{gain/cost price}) \times 100$$

$$20\% = [(96/x) - (20/9)] / (20/9) \times 100$$

$$20/100 = [(96/x) - (20/9)] / (20/9) \times 100$$

$$(20/100 \times 200/9) + 200/90 = 96/x$$

$$4/9 + 200/90 = 96/x$$

$$(40+200)/90 = 96/x$$

$$240/90 = 96/x$$

$$24/9 = 96/x$$

By cross multiplying

$$24x = 96 \times 9$$

$$x = 864/24$$

$$= 36$$

∴ 36 ball pens can be sold at a price of Rs 96

**16. A man sells an article at a profit of 25%. If he had bought it at 20% less and sold it for Rs 36.75 less, he would have gained 30%. Find the cost price of the article.**

**Solution:**

Let us consider the cost price of article be Rs x

The Profit percent is = 25% of 100 = 25/100

Selling price of article =  $x + x \times 25/100$

$$= x + x/4$$

$$= (4x+x)/4$$

$$= \text{Rs } 5x/4$$

If cost price of article is 20% less (given) = 20% of 100 = 20/100

Now, cost price is =  $x - x \times 20/100$

$$= x - x/5$$

$$= (5x-x)/5$$

$$= \text{Rs } 4x/5$$



Now, selling price is =  $Rs 5x/4 - 36.75$

The Profit percent is =  $30\%$  of  $100 = 30/100$

He would have gained  $30\%$  selling at that price (Given)

We know that,  $\text{Gain} = \text{SP} - \text{CP}$

$$= 5x/4 - 36.75 - 4x/5$$

$$= (25x - 16x)/20 - 36.75$$

$$= 9x/20 - 36.75$$

$$\text{Gain \%} = (\text{gain/cost price}) \times 100$$

$$30\% = [(5x/4) - 36.75] - (4x/5) / (4x/5) \times 100$$

$$30/100 = (9x/20 - 36.75) / (4x/5) \times 100$$

$$x = 175$$

$\therefore$  Cost price of article is Rs 175

**17. A dishonest shopkeeper professes to sell pulses at his cost price but uses a false weight of 950 gm for each kilogram. Find his gain percent.**

**Solution:**

Let us consider the cost price of 1000gm pulses be Rs x

Selling price of 950 gm pulses is also = Rs x

Selling price of 1000 gm pulses =  $x/950 \times 1000$

So,  $\text{Gain} = \text{SP} - \text{CP}$

$$\text{Gain} = 1000x/950 - x$$

$$= (1000x - 950x)/950$$

$$= 50x/950$$

$$\text{Gain \%} = (\text{gain/cost price}) \times 100$$

$$= (50x/950)/x \times 100$$

$$= 50x/950x \times 100$$

$$= 5/95 \times 100$$

$$= 100/19$$

$$= 5 \frac{5}{19}\%$$

$\therefore$  The Shopkeeper's gain percent is  $5 \frac{5}{19}\%$

**18. A dealer bought two tables for Rs 3120. He sold one of them at loss of 15% and other at a gain of 36%. Then, he found that each table was sold for the same price. Find the cost price of each table.**

**Solution:**

Given, the cost price of two tables is = Rs 3120

Let cost price of first table be = Rs x

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Then, cost price of second table will be = Rs 3120 – x

We know that one is a gain and other is a loss.

$$\begin{aligned}\text{Selling price of first table (gain)} &= x + x \times 36/100 \\ &= x + 9x/25 \\ &= (25x + 9x)/25 \\ &= \text{Rs } 34x/25\end{aligned}$$

$$\begin{aligned}\text{Selling price of second table (loss)} &= (3120 - x) \times 85/100 \\ &= \text{Rs } (3120 \times 85 - 85x)/100\end{aligned}$$

So now, by equating both we get,

$$34x/25 = (3120 \times 85 - 85x)/100$$

$$34x = (3120 \times 85 - 85x)/4$$

$$34x \times 4 = 3120 \times 85 - 85x$$

$$136x + 85x = 3120 \times 85$$

$$221x = 3120 \times 85$$

$$x = (3120 \times 85)/221$$

$$= 1200$$

∴ Cost price of first table (x) is = Rs 1200

Cost price of second table (3120 - x) = 3120 - 1200 = Rs 1920

**19. Mariam bought two fans for Rs 3605. She sold one at a profit of 15% and the other at a loss of 9%. If Mariam obtained the same amount for each fan, find the cost price of each fan.**

**Solution:**

Given, cost price of 2 fans is = Rs 3605

Let cost price of 1 fan be = Rs x

Then CP of other fan will be = Rs 3605 – x

We know that one is a gain and other is a loss.

$$\begin{aligned}\text{Selling price of first fan (gain)} &= x + x \times 15/100 \\ &= x + x \times 3/20 \\ &= (20x + 3x)/20 \\ &= \text{Rs } 23x/20\end{aligned}$$

$$\begin{aligned}\text{Selling price of second fan (loss)} &= (3605 - x) \times 91/100 \\ &= \text{Rs } (3605 \times 91 - 91x)/100\end{aligned}$$

So now, by equating both we get,

$$23x/20 = (3605 \times 91 - 91x)/100$$

$$23x = (3605 \times 91 - 91x)/5$$

$$23x \times 5 = 3605 \times 91 - 91x$$

$$115x + 91x = 3605 \times 91$$

$$206x = 3605 \times 91$$

$$x = (3605 \times 91)/206$$

$$= 1592.50$$

∴ Cost price of one fan (x) is = Rs 1592.50

Cost price of second fan (3605 - x) is =  $3605 - 1592.50 = \text{Rs } 2012.50$

**20. Some toffees are bought at the rate of 11 for Rs 10 and the same number at the rate of 9 for Rs 10. If the whole lot is sold at one rupee per toffee, find the gain or loss percent on the whole transaction.**

**Solution:**

Let the total number of toffees be 'x'

Given, cost price of 11 toffees is = Rs 10

Cost price of 1 toffee is = Rs 10/11

Given, cost price of 9 toffees is = Rs 10

Cost price of 1 toffee is = Rs 10/9

When equating both the costs we get,

Cost price of two toffees =  $(10/11) + (10/9)$

$$= (90 + 110)/99$$

$$= 200/99$$

Cost price of one toffee is =  $(\text{Rs } 200/99)/2 = \text{Rs } 200/198$

We know that selling price of 1 toffee (Given) = Rs 1

Loss = CP - SP

$$= 200/198 - 1$$

$$= (200 - 198)/198$$

$$= 2/198$$

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

$$= (2/198)/(200/198) \times 100$$

$$= 2/198 \times 198/200 \times 100$$

$$= 2/200 \times 100$$

$$= 2/2$$

$$= 1\%$$

∴ It is 1% loss on the whole truncation.

**21. A tricycle is sold at a gain of 16%. Had it been sold for Rs 100 more, the gain would have been 20%. Find the C.P. of the tricycle.**

**Solution:**

Let us consider the cost price of tricycle be = Rs x

Selling price of the tricycle be = Rs x

Given, Gain% = 16% of 100 = 16/100

$$\begin{aligned}\text{Selling price of tricycle} &= x + x \times 16/100 \\ &= (100x + 16x)/100 \\ &= 116x/100 \\ &= 29x/25\end{aligned}$$

Given, if selling price is Rs 100 more

New Selling price =  $29x/25 + 100$

Then, Gain% = 20%

By using the formula

Gain % = (gain/cost price) × 100 [by using Gain = SP – CP]

$$20 = \frac{[(29x/25) + 100] - x}{x} \times 100$$

$$20x/100 = (29x + 2500 - 25x)/25$$

$$x/5 = (29x + 2500 - 25x)/25$$

$$5x = 4x + 2500$$

$$x = 2500$$

∴ Cost price of tricycle is Rs 2500

**22. Shabana bought 16 dozen ball pens and sold them at a loss equal to S.P. of 8 ball pens. Find**

**(i) her loss percent**

**(ii) S.P. of 1 dozen ball pens, if she purchased these 16 dozen ball pens for Rs 576.**

**Solution:**

Given, number of ball pens bought by Shabana is = 16 dozen =  $16 \times 12 = 192$  pens

So, let's consider the cost price of each pen as Rs x

CP of 8 pens = Rs 8x

Let SP of one pen be = Rs x

So, SP of 192 pens = 192x

Given, loss of 192 pens = SP of 8 ball pens

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So, loss = 8SP

$$192x = (192+8) \text{ SP}$$

$$\text{SP} = 192x/200$$

$$\text{Loss} = \text{CP} - \text{SP}$$

$$= x - 192x/200$$

$$(i) \text{ Loss\%} = (\text{loss}/\text{CP}) \times 100$$

$$= (x - 192x/200)/x \times 100$$

$$= (200x - 192x)/200x \times 100$$

$$= 8/2$$

$$= 4\%$$

(ii) Given, CP of 16 dozen pens = Rs 576

$$192x = 576$$

$$x = 576/192$$

We know that SP of 1 pen =  $192x/200$

$$\text{SP of dozen pens} = 12 \times 192x/200$$

$$= 12 \times 192/200 \times 576/192$$

$$= 12 \times 576/200$$

$$= 34.56$$

$\therefore$  Loss% = 4% and SP of 1 dozen pens is Rs 34.56

**23. The difference between two selling prices of a shirt at profits of 4% and 5% is Rs 6. Find**

**(i) C.P. of the shirt**

**(ii) The two selling prices of the shirt**

**Solution:**

(i) Let the CP of shirt be = Rs x

Profit (4%) = 4/100 of CP

$$= 4/100 \times x$$

$$= 4x/100$$

Selling Price = C.P + Profit

$$= x + 4x/100$$

$$= (100x + 4x)/100$$

$$= 104x/100$$

(ii) Let the CP of shirt be = Rs x

Profit (5%) = 5/100 of CP

$$= 5/100 \times x$$

$$= 5x/100$$



$$\begin{aligned}\text{Selling Price} &= \text{C.P} + \text{Profit} \\ &= x + 5x/100 \\ &= (100x + 5x)/100 \\ &= 105x/100\end{aligned}$$

Given that, the difference between the two selling price is Rs 6

$$\text{So, } 105x/100 - 104x/100 = 6$$

$$(105x - 104x)/100 = 6$$

$$x/100 = 6$$

$$x = 600$$

∴ Now, C.P of the shirt is = Rs 600

$$\text{Selling Price of one shirt} = 104x/100 = (104 \times 600)/100 = \text{Rs } 624$$

$$\text{Selling Price of other shirt} = 105x/100 = (105 \times 600)/100 = \text{Rs } 630$$

**24. Toshiba bought 100 hens for Rs 8000 and sold 20 of these at a gain of 5%. At what gain percent she must sell the remaining hens so as to gain 20% on the whole?**

**Solution:**

Given, Total hens = 100

Remaining hens =  $100 - 20 = 80$  hens

Toshiba bought 100 hens for = Rs 8000

1 hen cost is =  $8000/100 = \text{Rs } 80$

20hens cost =  $20 \times 80 = \text{Rs } 1600$

Given, Gain = 5%

$$\text{SP} = 105/100 \times 1600$$

$$= \text{Rs } 1680$$

CP for 80 hens =  $80 \times 80 = \text{Rs } 6400$

SP of 80 hens = Rs  $(1600 + 1680 - 80) = \text{Rs } 7920$

Gain on 80 hens = SP of 80 hens – CP of 80 hens

$$= 7920 - 6400$$

$$= \text{Rs } 1520$$

$$\text{Gain \%} = (\text{gain}/\text{cost price}) \times 100$$

$$\text{Gain\% on 80 hens} = (1520/6400) \times 100$$

$$= 23.75\%$$

∴ Toshiba require 23.75% gain on the remaining hens (80hens).

## EXERCISE 13.2

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**1. Find the S.P. if****(i) M.P. = Rs 1300 and Discount = 10%****(ii) M.P. = Rs 500 and Discount = 15%****Solution:****(i) Given,**

M.P. = 1300

Discount = 10%

By using the formulas

SP = Marked price (MP) – Discount

Discount =  $(MP \times \text{Discount \%})/100$ Discount% =  $(\text{Discount})/M.P. \times 100$ 

By using,

Discount =  $(MP \times \text{Discount \%})/100$  $= (1300 \times 10)/100$  $= \text{Rs } 130$ 

SP = MP - Discount

 $= (1300 - 130) = \text{Rs } 1170$ **(ii) Given,**

M.P. = 500

Discount = 15%

By using,

Discount =  $(MP \times \text{Discount \%})/100$  $= (500 \times 15)/100$  $= \text{Rs } 75$ 

SP = MP - Discount

 $= (500 - 75) = \text{Rs } 425$ **2. Find the M.P. if****(i) S.P. = Rs 1222 and Discount = 6%****(ii) S.P. = Rs 495 and Discount = 1%****Solution:****(i) Given,**

SP = Rs 1222

Discount = 6%

By using the formula

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$$\begin{aligned} \text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount \%}) \\ &= (100 \times 1222) / (100 - 6) \\ &= 122200/94 \\ &= \text{Rs } 1300 \end{aligned}$$

(ii) Given,

$$\text{SP} = \text{Rs } 495$$

$$\text{Discount} = 1\%$$

By using the formula

$$\begin{aligned} \text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount \%}) \\ &= (100 \times 495) / (100 - 1) \\ &= 49500/99 \\ &= \text{Rs } 500 \end{aligned}$$

**3. Find the discount in percent when**

(i) M.P. = Rs. 900 and S.P. = Rs. 873

(ii) M.P. = Rs. 500 and S.P. = Rs. 425

**Solution:**

(i) Given,

$$\text{MP} = \text{Rs } 900$$

$$\text{SP} = \text{Rs } 873$$

By using the formula

$$\begin{aligned} \text{Discount\%} &= (\text{MP} - \text{SP})/\text{MP} \times 100 \\ &= (900-873)/900 \times 100 \\ &= 27/900 \times 100 \\ &= 3\% \end{aligned}$$

(ii) Given,

$$\text{MP} = \text{Rs } 500$$

$$\text{SP} = \text{Rs } 425$$

By using the formula

$$\begin{aligned} \text{Discount\%} &= (\text{MP} - \text{SP})/\text{MP} \times 100 \\ &= (500-425)/500 \times 100 \\ &= 75/500 \times 100 \\ &= 15\% \end{aligned}$$

**4. A shop selling sewing machines offers 3% discount on all cash purchases. What cash amount does a customer pay for a sewing machine the price of which is marked as Rs 650.**

**Solution:**

Given,

$$MP = \text{Rs } 650$$

$$\text{Discount} = 3\%$$

$$\begin{aligned}\text{So, } 3\% \text{ of } MP &= 3/100 \times 650 \\ &= \text{Rs } 19.5\end{aligned}$$

$$MP = MP - \text{discount}$$

$$= 650 - 19.5$$

$$= \text{Rs } 630.5$$

∴ Customer has to pay Rs 630.50

**5. The marked price of a ceiling fan is Rs 720. During off season, it is sold for Rs. 684. Determine the discount percent.**

**Solution:**

Given,

$$MP = \text{Rs } 720$$

$$SP = \text{Rs } 684$$

By using the formula,

$$\text{Discount} = M.P. - S.P.$$

$$= 720 - 684 = \text{Rs } 36$$

$$\text{Discount}\% = (\text{Discount}/MP) \times 100$$

$$= 36/720 \times 100$$

$$= 5\%$$

∴ Discount% is 5%

**6. On the eve of Gandhi Jayanti a saree is sold for Rs. 720 after allowing 20% discount. What is its marked price?**

**Solution:**

Given,

$$SP \text{ of the saree} = \text{Rs } 720$$

$$\text{Discount} = 20\%$$

By using the formula

$$MP = (100 \times SP) / (100 - \text{Discount } \%)$$

$$= (100 \times 720) / (100 - 20)$$

$$= 72000/80$$

$$= \text{Rs } 900$$

∴ Marked Price = Rs 900

7. After allowing a discount of  $7\frac{1}{2}\%$  on the marked price, an article is sold for Rs. 555. Find its marked price.

**Solution:**

Given,

SP of the article = Rs 555

Discount =  $7\frac{1}{2}\% = 15/2\%$

By using the formula

$$\begin{aligned} \text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount } \%) \\ &= (100 \times 555) / (100 - (15/2)) \\ &= (100 \times 555) / ((200 - 15)/2) \\ &= (100 \times 555) / (92.5) \\ &= 55500/92.5 \\ &= \text{Rs } 600 \end{aligned}$$

∴ Marked Price = Rs 600

8. A shopkeeper allows his customers 10% off on the marked price of goods and still gets a profit of 25%. What is the actual cost to him of an article marked Rs. 250?

**Solution:**

Given, 10% off on marked price

M.P. = 250

Discount = 10%

By using,

$$\begin{aligned} \text{Discount} &= (\text{MP} \times \text{Discount } \%) / 100 \\ &= (250 \times 10) / 100 \\ &= \text{Rs } 25 \end{aligned}$$

$$\begin{aligned} \text{SP} &= \text{MP} - \text{Discount} \\ &= (250 - 25) = \text{Rs } 225 \end{aligned}$$

And 25% profit he gets additionally,

So, by using the formula,

$$\begin{aligned} \text{CP} &= 100 / (100 + \text{Gain } \%) \times \text{SP} \\ &= 100 / (100 + 25) \times 225 \\ &= 100/125 \times 225 \\ &= 180 \end{aligned}$$

∴ Actual cost of the article is Rs 180

9. A shopkeeper allows 20% off on the marked price of goods and still gets a profit of 25%. What is the actual cost to him of an article marked Rs. 500?

**Solution:**



Given, 20% off on marked price  
 $MP = 500$   
Discount = 20%  
Discount =  $(MP \times \text{Discount \%})/100$   
 $= (500 \times 20)/100$   
 $= \text{Rs } 100$   
 $SP = MP - \text{Discount}$   
 $= (500 - 100) = \text{Rs } 400$

And 25% profit he gets additionally,  
So, by using the formula,  
 $CP = 100 / (100 + \text{Gain \%}) \times SP$   
 $= 100 / (100 + 25) \times 400$   
 $= 100/125 \times 400$   
 $= 320$

$\therefore$  Actual cost of the article is Rs 320

**10. A tradesman marks his goods at such a price that after allowing a discount of 15%, he makes a profit of 20%. What is the marked price of an article whose cost price is Rs. 170?**

**Solution:**

Given,  
CP of the article = Rs 170  
Profit = 20%  
So, by using the formula,  
Selling price =  $(100 + \text{Gain \%})/100 \times CP$   
 $= (100 + 20)/100 \times 170$   
 $= 120/100 \times 170$   
 $= 204$

$SP = \text{Rs } 204$   
Discount = 15%  
By using the formula  
 $MP = (100 \times SP) / (100 - \text{Discount \%})$   
 $= (100 \times 204) / (100 - 15)$   
 $= (100 \times 204) / 85$   
 $= 20400/85$   
 $= \text{Rs } 240$

$\therefore$  Marked Price = Rs 240

**11. A shopkeeper marks his goods in such a way that after allowing a discount of 25% on the marked price, he still makes a profit of 50%. Find the ratio of the C.P. to the M.P.**

**Solution:**

Given,

$$\text{Discount} = 25\%$$

$$\begin{aligned}\text{Discount} &= (\text{MP} \times \text{Discount \%})/100 \\ &= (\text{MP} \times 25)/100 \\ &= \text{Rs } 25\text{MP}/100\end{aligned}$$

$$\begin{aligned}\text{SP} &= \text{MP} - \text{Discount} \\ &= (\text{MP} - 25\text{MP}/100) \\ &= (100\text{MP} - 25\text{MP})/100 \\ &= 75\text{MP}/100\end{aligned}$$

We know that the given profit = 50%

$$\begin{aligned}\text{Selling price} &= (100 + \text{Gain \%})/100 \times \text{CP} \\ &= (100 + 50)/100 \times \text{CP} \\ &= 150/100 \times \text{CP} \\ &= 150\text{CP}/100\end{aligned}$$

By equating both SP we get,

$$75\text{MP}/100 = 150\text{CP}/100$$

$$75\text{MP}/150\text{CP} = 100/100$$

$$75\text{MP}/150\text{CP} = 1$$

(By cross multiplying)

$$\text{CP}/\text{MP} = 75/150$$

$$= 1/2$$

∴ The ratio CP to MP = 1:2

**12. A cycle dealer offers a discount of 10% and still makes a profit of 26%. What is the actual cost to him of a cycle whose marked price is Rs. 840?**

**Solution:**

Given,

$$\text{Marked price (MP) on cycle} = \text{Rs } 840$$

$$\text{Discount} = 10\%$$

$$\begin{aligned}\text{Discount} &= (\text{MP} \times \text{Discount \%})/100 \\ &= (840 \times 10)/100 \\ &= \text{Rs } 84\end{aligned}$$

$$\text{SP} = \text{MP} - \text{Discount}$$

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$$= 840 - 84$$

$$= \text{Rs } 756$$

Given, he makes a profit of 26% additionally

So, by using the formula,

$$\text{CP} = 100 / (100 + \text{Gain \%}) \times \text{SP}$$

$$= 100 / (100 + 26) \times 756$$

$$= 100/126 \times 756$$

$$= 600$$

∴ Actual cost of the cycle is Rs 600

**13. A shopkeeper allows 23% commission in his advertised price and still makes a profit of 10%. If he gains Rs. 56 on one item, find his advertised price.**

**Solution:**

Let us consider the advertised price be = Rs x

And the commission on the advertised price = 23% = Rs 23x/100

Selling price = advertised price – commission

$$= x - 23x/100$$

$$= (100x - 23x)/100$$

$$= \text{Rs } 77x/100 \dots\dots(\text{equation 1})$$

Given gain = Rs 56

Profit percent = 10%

So, by using the formula,

$$\text{Gain\%} = (\text{gain}/\text{CP}) \times 100$$

$$10 = (56/\text{CP}) \times 100$$

$$10/100 = 56/\text{CP}$$

$$\text{CP} = 560$$

$$\text{Gain} = \text{SP} - \text{CP}$$

$$\text{SP} = 560 + 56 = \text{Rs } 616$$

From the above equation 1 we get,

$$77x/100 = 616$$

$$x = (616 \times 100)/77$$

$$= 800$$

∴ advertised price is Rs 800

**14. A shopkeeper marked his goods at 40% above the cost price but allows a discount of 5% for cash payment to his customers. What actual profit does he make, if he receive Rs. 1064 after paying the discount?**

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**Solution:**

Given,

Shopkeeper marks his goods at 40% above the cost price.

Let the cost price be 'x'

Marked price is  $140x/100$  (40 more than 100 if CP is 100)

Discount on marked price is 5%

$$\begin{aligned}\text{Discount} &= (\text{MP} \times \text{Discount \%})/100 \\ &= (140x/100 \times 5)/100 \\ &= (7x/100)\end{aligned}$$

$$\begin{aligned}\text{SP} &= \text{MP} - \text{Discount} \\ &= 140x/100 - 7x/100 \\ &= (140x - 7x)/100 \\ &= \text{Rs } 133x/100\end{aligned}$$

Given SP = Rs 1064

Equating both the SP we get,

$$1064 = 133x/100$$

$$133x = 1064 \times 100$$

$$\begin{aligned}x &= (1064 \times 100)/133 \\ &= 800\end{aligned}$$

Now, the cost price = Rs 800

SP = Rs 1064

Profit = SP – CP

$$= 1064 - 800$$

$$= 264$$

∴ The actual profit is Rs 264

**15. By selling a pair of earrings at a discount of 25% on the marked price, a jeweller makes a profit of 16%. If the profit is Rs. 48, what is the cost price? What is the marked price and the price at which the pair was eventually bought?**

**Solution:**

Given,

Earrings are bought at 25% discount

Profit percent of seller = 16%

Gain = Rs 48

So, by using the formula,

$$\text{Gain\%} = (\text{gain}/\text{CP}) \times 100$$

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$$16 = (48/CP) \times 100$$

$$16/100 = 48/CP$$

$$CP = (48 \times 100)/16 \\ = \text{Rs } 300$$

Now,

$$CP = \text{Rs } 300$$

Cost price of the earrings = Rs 300

$$\text{Profit} = \text{Rs } 48$$

$$\text{Profit} = SP - CP$$

$$SP = \text{Profit} + CP$$

$$= 48 + 300$$

$$= 348$$

Given, additional discount of 25%

By using the formula

$$MP = (100 \times SP) / (100 - \text{Discount } \%) \\ = (100 \times 348) / (100 - 25) \\ = (100 \times 348) / 75 \\ = 34800/75 \\ = \text{Rs } 464$$

∴ Marked Price is Rs 464, CP is 300 and Final selling price is 348

**16. A publisher gives 32% discount on the printed price of a book to booksellers. What does a book seller pay for a book whose printed price is Rs. 275?**

**Solution:**

Given,

$$\text{Printed price (MP)} = \text{Rs } 275$$

$$\text{Discount} = 32\%$$

$$\text{Discount} = (MP \times \text{Discount } \%) / 100 \\ = (275 \times 32) / 100 \\ = 88$$

$$SP = MP - \text{Discount}$$

$$= 275 - 88$$

$$= \text{Rs } 187$$

∴ The book seller pays Rs 187

**17. After allowing a discount of 20% on the marked price of a lamp, a trader loses 10%. By what percentage is the marked price above the cost price?**

**Solution:**



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Given,

Let the cost price of the lamp be = Rs  $x$

$$\begin{aligned}\text{Then, SP} &= (100 - \text{loss}\%)/100 \times \text{CP} \\ &= (100 - 10)/100 \times x \\ &= 90x/100\end{aligned}$$

Now,

SP = Rs  $90x/100$  and Discount = 20%

By using the formula,

$$\begin{aligned}\text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount}\%) \\ &= (100 \times 90x/100) / (100 - 20) \\ &= 90x/80 \\ &= 9x/8\end{aligned}$$

Required difference = MP – CP

$$\begin{aligned}&= \text{Rs } (9x/8 - x) \\ &= (9x - 8x)/8 \\ &= \text{Rs } x/8\end{aligned}$$

$$\begin{aligned}\text{Discount}\% &= (x/8)/x \times 100 \\ &= 100/8 \\ &= 12.5\%\end{aligned}$$

∴ The trader must mark his goods 12.5% above the cost price.

**18. The list price of a table fan is Rs. 480 and it is available to a retailer at 25% discount. For how much should a retailer sell it to gain 15%?**

**Solution:**

Given,

List price of table fan (MP) is = Rs 480

Retailer buys it at discount of = 25%

Cost price for the retailer is  $(75/100) \times 480$

$$\begin{aligned}\text{So, CP} &= (75/100) \times 480 \\ &= \text{Rs } 360\end{aligned}$$

Now, the retailer sells the fan to get 15%

$$\text{Gain}\% = (\text{gain})/\text{CP} \times 100$$

$$15\% = (\text{SP} - \text{CP})/\text{CP} \times 100$$

$$\begin{aligned}\text{SP} &= 115/100 \text{ CP} \\ &= 115/100 \times 360 \\ &= 414\end{aligned}$$

∴ The retailer should sell the fan at Rs 414 to get a gain of 15%

**19. Rohit buys items at 25% discount on the marked price. He sells it for Rs. 660, making a profit of 10%. What is the marked price of the item?**

**Solution:**

Given, SP of the item = Rs 660  
Gain = 10%  
Let us consider his buying price be 'x' Rs  
So,  
 $x + 10\% \text{ of } x = 660$   
 $x + (10/100)x = 660$   
 $11/10 x = 660$   
 $x = (660 \times 10)/11$   
 $= 600$   
Therefore, he bought the item for Rs 600  
Now,  
Discount on the item = 25%  
Discount = 25% of SP  
 $MP = (100 \times SP) / (100 - \text{Discount \%})$   
 $= (100 \times 600) / (100 - 25)$   
 $= 60000/75$   
 $= \text{Rs } 800$   
 $\therefore$  The marked price of the item is Rs 800

**20. A cycle merchant allows 20% discount on the marked price of the cycles and still makes a profit of 20%. If he gains Rs. 360 over the sale of one cycle, find the marked price of the cycle.**

**Solution:**

Given,  
Profit% = 20%  
Gain over 1 cycle = Rs 360  
 $\text{Gain\%} = (\text{gain}/\text{CP}) \times 100$   
 $20 = 360/\text{CP} \times 100$   
 $20/100 = 360/\text{CP}$   
 $\text{CP} = \text{Rs } 1800$

By using the formula,

$$\begin{aligned} \text{SP} &= (100 + \text{gain\%})/100 \times \text{CP} \\ &= (100 + 20)/100 \times 1800 \\ &= 120/100 \times 1800 \\ &= \text{Rs } 2160 \end{aligned}$$

Given, Discount = 20%

$$\begin{aligned} \text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount \%}) \\ &= (100 \times 2160) / (100 - 20) \\ &= 216000/80 \\ &= \text{Rs } 2700 \end{aligned}$$

$\therefore$  The marked price of the cycle is Rs 2700

**21. Jyoti and Meena run a ready-made garment shop. They mark the garments at**

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such a price that even after allowing a discount of 12.5%, they make a profit of 10%. Find the marked price of a suit which costs them Rs. 1470.

**Solution:**

Given,

CP of suit = Rs 1470

Gain = 10%

By using the formula,

$$\begin{aligned} \text{SP} &= (100 + \text{gain}\%)/100 \times \text{CP} \\ &= (100 + 10)/100 \times 1470 \\ &= 110/100 \times 1470 \\ &= \text{Rs } 1617 \end{aligned}$$

Given, Discount = 12.5%

$$\begin{aligned} \text{So, MP} &= (100 \times \text{SP}) / (100 - \text{Discount \%}) \\ &= (100 \times 1617) / (100 - 12.5) \\ &= 161700/87.5 \\ &= \text{Rs } 1848 \end{aligned}$$

∴ The marked price of the suit is Rs 1848

**22. What price should Aslam mark on a pair of shoes which costs him Rs. 1200 so as to gain 12% after allowing a discount of 16%?**

**Solution:**

Given,

CP of pair of shoes = Rs 1200

Gain = 12%

By using the formula,

$$\begin{aligned} \text{SP} &= (100 + \text{gain \%})/100 \times \text{CP} \\ &= (100 + 12)/100 \times 1200 \\ &= 112/100 \times 1200 \\ &= \text{Rs } 1344 \end{aligned}$$

Given, Discount = 16%

$$\begin{aligned} \text{MP} &= (100 \times \text{SP}) / (100 - \text{Discount \%}) \\ &= (100 \times 1344) / (100 - 16) \\ &= 134400/84 \\ &= \text{Rs } 1600 \end{aligned}$$

∴ Aslam should mark pair of the shoes at Rs 1600

**23. Jasmine allows 4% discount on the marked price of her goods and still earns a profit of 20%. What is the cost price of a shirt for her marked at Rs. 850?**

**Solution:**

Given,

Gain = 20%

MP of the shirt = Rs 850

Discount = 4%

Discount allowed on the marked price of goods =  $\frac{4}{100} \times 850$   
= Rs 34

So, SP of the shirt =  $(850 - 34) = \text{Rs } 816$

By using the formula,

$$\begin{aligned}\text{CP} &= 100/(100 + \text{gain}\%) \times \text{SP} \\ &= 100/(100 + 20) \times 816 \\ &= 100/120 \times 816 \\ &= \text{Rs } 680\end{aligned}$$

$\therefore$  Cost price of a shirt is Rs 680

**24. A shopkeeper offers 10% off-season discount to the customers and still makes a profit of 26%. What is the cost price for the shopkeeper on a pair of shoes marked at Rs. 1120?**

**Solution:**

Given,

MP of pair of shoes = Rs 1120

Profit = 26%

Discount = 10%

Discount allowed =  $\frac{10}{100} \times 1120$   
= Rs 112

So, SP of the shoes =  $(1120 - 112) = \text{Rs } 1008$

By using the formula,

$$\begin{aligned}\text{CP} &= 100/(100 + \text{gain}\%) \times \text{SP} \\ &= 100/(100 + 26) \times 1008 \\ &= 100/126 \times 1008 \\ &= \text{Rs } 800\end{aligned}$$

$\therefore$  Cost price of a pair shoes is Rs 800

**25. A lady shopkeeper allows her customers 10% discount on the marked price of the goods and still gets a profit of 25%. What is the cost price of a fan for her**

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marked at Rs. 1250?

**Solution:**

Given,

MP of the fan = Rs 1250

Profit = 25%

Discount = 10%

Discount allowed =  $10/100 \times 1250$

= Rs 125

So, SP of the shoes =  $(1250 - 125) = \text{Rs } 1125$

By using the formula,

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

=  $100/(100 + 25) \times 1125$

=  $100/125 \times 1125$

= Rs 900

∴ Cost price of the fan is Rs 900



## EXERCISE 13.3

PAGES NO: 13.32

**1. The list price of a refrigerator is Rs. 9700. If a value added tax of 6% is to be charged on it, how much one has to pay to buy the refrigerator?**

**Solution:**

Given,

The list price of a refrigerator is = Rs 9700

VAT = 6%

Rate of VAT = 6% of Rs 9700

$$= \frac{6}{100} \times 9700$$

$$= \text{Rs } 582$$

$\therefore$  The total amount one has to pay to buy refrigerator is Rs 9700 + Rs 582 = Rs 10282

**2. Vikram bought a watch for Rs. 825. If this amount includes 10% VAT on the list prices. What was the list price of the watch?**

Given,

Vikram bought watch for = Rs 825

VAT = 10%

Let the list price of the watch be = Rs x

VAT at the rate of 10% on Rs x = Rs  $\frac{10}{100} \times x$  = Rs  $\frac{x}{10}$

So, the list price of the watch = Rs  $(x + \frac{x}{10})$  = Rs  $\frac{11x}{10}$

It is given that watch is bought at the price of Rs 825

$$\therefore \frac{11x}{10} = 825$$

$$x = \frac{(825 \times 10)}{11}$$

$$= 750$$

$\therefore$  List price of the watch is Rs 750

**3. Aman bought a shirt for Rs. 374.50 which includes 7% VAT. Find the list price of the shirt.**

**Solution:**

Given,

Aman bought a shirt for = Rs 374.50

VAT = 7%

Let the list price of the shirt be = Rs x

VAT at the rate of 7% on Rs x = Rs  $\frac{7}{100} \times x$  = Rs  $\frac{7x}{100}$

So, the list price of the shirt = Rs  $(x + \frac{7x}{100})$  = Rs  $\frac{107x}{100}$

It is given that shirt is bought at the price of Rs 374.50

$$\therefore \frac{107x}{100} = 374.50$$

$$x = \frac{(374.50 \times 100)}{107}$$

$$= 350$$

∴ List price of the shirt is Rs 350

**4. Rani purchases a pair of shoes whose sale price is Rs. 175. If she pays VAT at the rate of 7%, how much amount does she pay as VAT? Also, find the net value of the pair of shoes.**

**Solution:**

Given,

Sale price of shoes = Rs.175

VAT = 7%

VAT at the rate 7% of 175 =  $7/100 \times 175$  = Rs 12.25

∴ Net value of pair of shoes = sale price + VAT  
= 175 + 12.25 = Rs 187.25

**5. Swarna paid Rs. 20 as VAT on a pair of shoes worth Rs. 250. Find the rate of VAT.**

**Solution:**

Given,

List price of shoes = Rs.250

Let VAT be = x%

So, VAT at the rate x% of 250 = 20 (Given)

$$x = (20 \times 100) / 250 = 8\%$$

∴ VAT = 8%

**6. Sarita buys goods worth Rs. 5500. She gets a rebate of 5% on it. After getting the rebate if VAT at the rate of 5% is charged, find the amount she will have to pay for the goods.**

**Solution:**

Given,

Price of goods is = Rs 5500

Discount = 5%

VAT = 5% of selling price

So,

Selling price =  $95/100 \times 5500$  = Rs 5225

And,

VAT =  $5/100 \times 5225$  = Rs 261.25

∴ Sarita has to pay an amount of Rs (5225 + 261.25) = Rs 5486.25 for the goods

**7. The cost of furniture inclusive of VAT is Rs. 7150. If the rate of VAT is 10%, find the original cost of the furniture.**

**Solution:**

Given,

Cost of furniture inclusive of VAT is = Rs 7150

VAT = 10%

Let us consider the original cost of furniture be = Rs x

VAT at the rate of 10% on Rs x = Rs  $10/100 \times x$  = Rs  $10x/100$

So,

$$x + 10x/100 = 7150$$

$$(100x+10x)/100 = 7150$$

$$110x/100 = 7150$$

$$11x/10 = 7150$$

$$11x = 7150 \times 10$$

$$x = 71500/11$$

$$= 6500$$

∴ Original cost of the furniture is Rs 6500

**8. A refrigerator is available for Rs. 13750 including VAT. If the rate of VAT is 10%, find the original cost of the refrigerator.**

**Solution:**

Given,

Cost of refrigerator inclusive of VAT is = Rs 13750

VAT = 10%

Let us consider the original cost of refrigerator be = Rs x

VAT at the rate of 10% on Rs x = Rs  $10/100 \times x$  = Rs  $10x/100$

So,

$$x + 10x/100 = 13750$$

$$(100x+10x)/100 = 13750$$

$$110x/100 = 13750$$

$$11x/10 = 13750$$

$$11x = 13750 \times 10$$

$$x = 137500/11$$

$$= 12500$$

∴ Original cost of the refrigerator is Rs 12500

**9. A colour T.V. is available for Rs. 13440 inclusive of VAT. If the original cost of TV is Rs. 12000, find the rate of VAT.**

**Solution:**

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Given,

Cost of TV inclusive of VAT is = Rs 13440

Original cost of the TV is = Rs 12000

So, let us consider the rate of VAT =  $x\%$

VAT at the rate of  $x\%$  on Rs 12000 =  $\text{Rs } x/100 \times 12000 = \text{Rs } 120x$

So,

$$12000 + 120x = 13440$$

$$120x = 13440 - 12000$$

$$120x = 1440$$

$$x = 1440/120$$

$$= 12$$

$$\therefore \text{Rate of VAT} = 12\%$$

**10. Reena goes to a shop to buy a radio, costing Rs. 2568. The rate of VAT is 7%. She tells the shopkeeper to reduce the price of the radio such that she has to pay Rs. 2568, inclusive of VAT. Find the reduction needed in the price of radio.**

**Solution:**

Given,

Cost of the radio is = Rs 2568

VAT = 7%

Let the reduced price of the radio after discount be Rs  $x$ .

Then,

$$\text{VAT} = 7\% \text{ of } x = \text{Rs } 7x/100$$

$$\text{So, SP} = \text{Rs } (x + 7x/100) = \text{Rs } 107x/100$$

It is given that the selling price should be Rs 2568

$$107x/100 = 2568$$

$$107x = 2568 \times 100$$

$$x = 256800/107$$

$$= 2400$$

Reduced price of the radio after discount = Rs 2400

$$\therefore \text{Reduction needed in the price of the radio is Rs } (2568 - 2400) = \text{Rs } 168$$

**11. Rajat goes to a departmental store and buys the following articles:**

Item	Price per item	Rate of VAT
2 Pairs of shoes	Rs 800	5%
1 sewing machine	Rs 1500	6%
2 tea – sets	Rs 650	4%

Calculate the total amount he has to pay to the store.



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**Solution:**

Given,

CP of 2 pair of shoes = Rs  $800 \times 2$  = Rs 1600

Rate of VAT = 5%

So,

VAT = 5% of 1600 =  $\frac{5}{100} \times 1600$  = Rs 80

So, amount Rajat paid for 2 pair of shoes = Rs (1600+80) = Rs 1680

CP of 1 sewing machine = Rs 1500

Rate of VAT = 6%

So,

VAT = 6% of 1500 =  $\frac{6}{100} \times 1500$  = Rs 90

So, amount Rajat paid for 1 sewing machine = Rs (1500+90) = Rs 1590

CP of 2 tea-sets = Rs.650  $\times 2$  = Rs 1300

Rate of VAT = 4 %

VAT = 4% of 1300 =  $\frac{4}{100} \times 1300$  = Rs 52

So, amount Rajat paid for 2 tea-sets = Rs (1300+52) = Rs 1352

 $\therefore$  Total amount Rajat needs to pay is Rs (1680+1590+1352) = Rs 4662**12. Ajit buys a motorcycle for Rs. 17600 including value added tax. If the rate of VAT is 10%, what is the sale price of the motorcycle?****Solution:**

Given,

Cost of motorcycle including VAT = Rs 17600

Rate of VAT = 10%

Let us consider the sale price be = Rs x

VAT at the rate of 10% on Rs x = Rs  $\frac{10}{100} \times x$  = Rs  $\frac{10x}{100}$ 

So,

$$x + \frac{10x}{100} = 17600$$

$$\frac{11x}{10} = 17600$$

$$11x = 17600 \times 10$$

$$x = \frac{176000}{11}$$

$$= 16000$$

 $\therefore$  Sale price of the motorcycle is Rs 16000**13. Manoj buys a leather coat costing Rs. 900 at Rs. 990 after paying the VAT. Calculate the rate of VAT charged on the coat.**



**Solution:**

Given,

CP of the coat is = Rs 900

Let the rate of VAT be =  $x\%$

So,

$$\text{VAT} = \frac{x}{100} \times 900 = \text{Rs } 9x$$

So from the question,

$$900 + 9x = 990$$

$$9x = 90$$

$$x = 10$$

$\therefore$  Manoj was charged 10% VAT on the leather coat

**14. Rakesh goes to a departmental store and purchases the following articles:**

(i) Biscuits and bakery products costing Rs. 50, VAT @ 5%

(ii) medicine costing Rs.90, VAT @ 10%

(iii) clothes costing Rs. 400, VAT @ 1% and

(iv) cosmetics costing Rs. 150, VAT @ 10%.

Calculate the total amount to be paid by Rakesh to the store.

**Solution:**

(i) We have,

Cost of biscuits and bakery products = Rs 50

VAT = 5%

So, rate of VAT = 5% of 50 =  $\frac{5}{100} \times 50 = \text{Rs } 2.50$

Amount paid for biscuits and bakery products = Rs (50+2.50) = Rs 52.50

(ii) We have,

Cost of medicine = Rs 90

VAT = 10%

So, rate of VAT = 10% of 90 =  $\frac{10}{100} \times 90 = \text{Rs } 9$

Amount paid for medicines = Rs (90+9) = Rs 99

(iii) We have,

Cost of clothes = Rs 400

VAT = 1%

So, rate of VAT = 1% of 400 =  $\frac{1}{100} \times 400 = \text{Rs } 4$

Amount paid for clothes = Rs (400+4) = Rs 404

(iv) We have,

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Cost of cosmetics = Rs 150

VAT = 10%

So, rate of VAT = 10% of 150 =  $10/100 \times 150$  = Rs 15

Amount paid for the cosmetics is = Rs (150+15) = Rs 165

∴ Total amount Rakesh paid at departmental store = Rs (52.50+99+404+165) = Rs 720.50

**15. Rajeeta purchased a set of cosmetics. She paid Rs. 165 for it including VAT. If the rate of VAT is 10%, find the sale price of the set.**

**Solution:**

Given,

Cost of set of cosmetics = Rs 165

VAT = 10%

Let us consider the sale price of set be = Rs x

Rate of VAT = 10% of x =  $10x/100$

So,

$$x + 10x/100 = 165$$

$$11x/10 = 165$$

$$11x = 165 \times 10$$

$$x = 1650/11$$

$$= 150$$

∴ Sale price of set of cosmetics is Rs 150

**16. Sunita purchases a bicycle for Rs. 660. She has paid a VAT of 10%. Find the list price of the bicycle?**

**Solution:**

Given,

Cost of bicycle = Rs 660

VAT = 10%

Let us consider the sale price of bicycle be = Rs x

Rate of VAT = 10% of x =  $10x/100$

So,

$$x + 10x/100 = 660$$

$$11x/10 = 660$$

$$11x = 660 \times 10$$

$$x = 6600/11$$

$$= 600$$

∴ List price of bicycle is Rs 600

**17. The sales price of a television, inclusive of VAT, is Rs. 13,500. If VAT is charged at the rate of 8% of the list price, find the list price of the television.**

**Solution:**

Given,

Cost of television inclusive of VAT is = Rs 13440

Let us consider the list price of television be = Rs x

VAT = 8%

Rate of VAT = 8% of x =  $\frac{8}{100} \times x = \frac{8x}{100}$

So,

$$x + \frac{8x}{100} = 13500$$

$$\frac{108x}{100} = 13500$$

$$108x = 13500 \times 100$$

$$x = \frac{1350000}{108}$$

$$= 12500$$

∴ List price of television is Rs 12500

**18. Shikha purchased a car with a marked price of Rs. 210000 at a discount of 5%. If VAT is charged at the rate of 10%, find the amount Shikha had paid for purchasing the car.**

**Solution:**

Given,

Marked price = Rs 210000

Discount = 5% of Rs 210000 =  $\text{Rs} = \frac{5}{100} \times 210000 = \text{Rs } 10500$

The net price of the car is  $\text{Rs } 210000 - \text{Rs } 10500 = \text{Rs } 199500$

VAT = 10%

Rate of VAT = 10% of Rs 199500 =  $\text{Rs } \frac{10}{100} \times 199500 = \text{Rs } 19950$

So, SP of the car =  $\text{Rs } (199500 + 19950) = \text{Rs } 219450$

∴ Shikha has paid Rs 219450 to purchase the car.

**19. Shruti bought a set of cosmetic items for Rs. 345 including 15% value added tax and a purse for Rs. 110 including 10% VAT. What percent is the VAT charged on the whole transaction?**

**Solution:**

Given,

CP of set of cosmetic items = Rs 345

Let us consider the price of cosmetic be = Rs x

VAT = 15% =  $\frac{15}{100} \times x = \frac{15x}{100}$

So,

$$x + \frac{15x}{100} = 345$$

$$\begin{aligned}115x/100 &= 345 \\115x &= 345 \times 100 \\x &= 34500/115 \\&= 300\end{aligned}$$

CP of purse = Rs 110

Let us consider the price of purse be = Rs y

$$\text{VAT} = 10\% = 10/100 \times y = 10y/100 = y/10$$

So,

$$y + y/10 = 110$$

$$11y/10 = 110$$

$$11y = 110 \times 10$$

$$y = 1100/11$$

$$= 100$$

$$\text{So, Total price} = 300 + 100 = \text{Rs } 400$$

Let the VAT on the whole transaction be  $r\%$

$$\text{Now, } r\% \text{ of } 400 = r/100 \times 400 = 4r$$

So,

$$400 + 4r = (345 + 110)$$

$$400 + 4r = 455$$

$$4r = 455 - 400$$

$$4r = 55$$

$$r = 55/4$$

$$= 13.75$$

$\therefore$  VAT on whole transaction is 13.75%

**20. List price of a cooler is Rs. 2563. The rate of VAT is 10%. The customer requests the shopkeeper to allow a discount in the price of the cooler to such an extent that the price remains Rs. 2563 inclusive of VAT. Find the discount in the price of the cooler.**

**Solution:**

Given,

Cost of the cooler is = Rs 2563

VAT = 10%

Let the reduced price of the radio after discount be Rs x.

Then,

$$\text{VAT} = 10\% \text{ of } x = \text{Rs } 10x/100$$

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$$\text{So, SP} = \text{Rs } (x + 10x/100) = \text{Rs } 110x/100$$

It is given that the selling price should be Rs 2563

$$110x/100 = 2563$$

$$110x = 2563 \times 100$$

$$x = 256300/110$$

$$= 2330$$

Reduced price of the cooler after discount = Rs 2330

$\therefore$  Discount needed in the price of the cooler is Rs  $(2563 - 2330) = \text{Rs } 233$

**21. List price of a washing machine is Rs. 9000. If the dealer allows a discount of 5% on the cash payment, how much money will a customer pay to the dealer in cash, if the rate of VAT is 10%?**

**Solution:**

Given,

List price of washing machine is = Rs 9000

Discount allowed =  $5\% = 5/100$

Selling price =  $5/100 \times 9000 = \text{Rs } 450$

So, cost of washing machine = list price – discount

$$= \text{Rs } 9000 - \text{Rs } 450$$

$$= \text{Rs } 8550$$

VAT =  $10\% \text{ of } 8550 = 10/100 \times 8550 = \text{Rs } 855$

$\therefore$  The customer has to pay an amount of Rs  $(8550 + 855) = \text{Rs } 9405$