

EXERCISE 13.2

Find the S.P. if

(i) M.P. = Rs 1300 and Discount = 10%

(ii) M.P. = Rs 500 and Discount = 15%

Solution:

(i) Given,

$$\text{M.P.} = 1300$$

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

By using the formulas

$$\text{SP} = \text{Marked price (MP)} - \text{Discount}$$

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

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

By using,

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

$$= (1300 \times 10)/100$$

$$= \text{Rs } 130$$

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

$$= (1300 - 130) = \text{Rs } 1170$$

(ii) Given,

$$\text{M.P.} = 500$$

$$\text{Discount} = 15\%$$

By using,

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

$$= (500 \times 15)/100$$

$$= \text{Rs } 75$$

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

$$= (500 - 75) = \text{Rs } 425$$

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,

$$\text{SP} = \text{Rs } 1222$$

$$\text{Discount} = 6\%$$

By using the formula

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

(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,

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

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

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

$$\begin{aligned}\text{MP} &= \text{MP} - \text{discount} \\ &= 650 - 19.5 \\ &= \text{Rs } 630.5\end{aligned}$$

∴ 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,

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

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

By using the formula,

$$\begin{aligned}\text{Discount} &= \text{M.P.} - \text{S.P.} \\ &= 720 - 684 = \text{Rs } 36\end{aligned}$$

$$\begin{aligned}\text{Discount}\% &= \left(\frac{\text{Discount}}{\text{MP}}\right) \times 100 \\ &= \frac{36}{720} \times 100 \\ &= 5\%\end{aligned}$$

∴ 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,

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

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

By using the formula

$$\begin{aligned}\text{MP} &= \frac{100 \times \text{SP}}{100 - \text{Discount } \%} \\ &= \frac{100 \times 720}{100 - 20} \\ &= \frac{72000}{80} \\ &= \text{Rs } 900\end{aligned}$$

∴ 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

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

\therefore 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,

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

SP = MP - Discount

$$= (250 - 25) = \text{Rs } 225$$

And 25% profit he gets additionally,

So, by using the formula,

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

\therefore 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

$$MP = 500$$

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

$$\begin{aligned}\text{Discount} &= (MP \times \text{Discount } \%)/100 \\ &= (500 \times 20)/100 \\ &= \text{Rs } 100\end{aligned}$$

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

$$= (500 - 100) = \text{Rs } 400$$

And 25% profit he gets additionally,

So, by using the formula,

$$\begin{aligned}CP &= 100 / (100 + \text{Gain } \%) \times SP \\ &= 100 / (100 + 25) \times 400 \\ &= 100/125 \times 400 \\ &= 320\end{aligned}$$

∴ 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,

$$CP \text{ of the article} = \text{Rs } 170$$

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

So, by using the formula,

$$\begin{aligned}\text{Selling price} &= (100 + \text{Gain } \%)/100 \times CP \\ &= (100 + 20)/100 \times 170 \\ &= 120/100 \times 170 \\ &= 204\end{aligned}$$

$$SP = \text{Rs } 204$$

$$\text{Discount} = 15\%$$

By using the formula

$$\begin{aligned}MP &= (100 \times SP) / (100 - \text{Discount } \%) \\ &= (100 \times 204) / (100 - 15) \\ &= (100 \times 204) / 85 \\ &= 20400/85 \\ &= \text{Rs } 240\end{aligned}$$

∴ 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,

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

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

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

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

$$= 840 - 84$$
$$= \text{Rs } 756$$

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?

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,

$$1064 = 133x/100$$

$$133x = 1064 \times 100$$

$$x = (1064 \times 100)/133$$

$$= 800$$

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,

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

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

$$16/100 = 48/CP$$

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

Now,

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

$$\text{Cost price of the earrings} = \text{Rs } 300$$

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

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

$$SP = \text{Profit} + CP \\ = 48 + 300 \\ = 348$$

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:

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,

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

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

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

∴ 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%

$$\begin{aligned}\text{Gain}\% &= (\text{gain})/\text{CP} \times 100 \\ 15\% &= (\text{SP} - \text{CP})/\text{CP} \times 100 \\ \text{SP} &= 115/100 \text{ CP} \\ &= 115/100 \times 360 \\ &= 414\end{aligned}$$

∴ 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
 $\text{Gain}\% = (\text{gain}/\text{CP}) \times 100$
 $20 = 360/\text{CP} \times 100$
 $20/100 = 360/\text{CP}$
CP = Rs 1800

By using the formula,
 $SP = (100 + \text{gain}\%)/100 \times CP$
 $= (100 + 20)/100 \times 1800$
 $= 120/100 \times 1800$
 $= \text{Rs } 2160$

Given, Discount = 20%
 $MP = (100 \times SP) / (100 - \text{Discount } \%)$
 $= (100 \times 2160) / (100 - 20)$
 $= 216000/80$
 $= \text{Rs } 2700$

\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

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,

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

∴ 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,

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

∴ 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

marked at Rs. 1250?

Solution:

Given,

MP of the fan = Rs 1250

Profit = 25%

Discount = 10%

Discount allowed = $\frac{10}{100} \times 1250$
= Rs 125

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

By using the formula,

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

= $\frac{100}{(100 + 25)} \times 1125$

= $\frac{100}{125} \times 1125$

= Rs 900

∴ Cost price of the fan is Rs 900



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