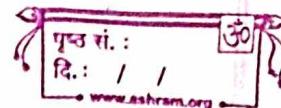


Topic : Profit & Loss , Percentage .

Ruturaj S. Aher



- 1) If an article is sold at a loss of 25% and the selling price is ₹ 450, find the C.P.?
- a) ₹ 500 b) ₹ 550 c) ₹ 600 d) ₹ 650

$$\rightarrow \text{Loss \%} = \frac{\text{CP} - \text{SP}}{\text{CP}} \times 100$$

$$\frac{25}{100} = \frac{\cancel{\text{CP}}}{\cancel{\text{CP}}} \left(1 - \frac{\text{SP}}{\cancel{\text{CP}}} \right) \times \cancel{100}$$

$$\frac{1}{4} + \frac{\text{SP}}{\text{CP}} = 1$$

$$\frac{\text{CP} + 4 \times 450}{4 \text{CP}} = 1$$

$$\text{CP} + 4 \times 450 = 4 \text{CP}$$

$$4 \times 450 = 3 \text{CP}$$

$$\text{CP} = ₹ 600 \quad (\text{d})$$

- 2) A person bought an item for ₹ 1200 and sold it for ₹ 1440. What is the profit %?
- a) 10% b) 15% c) 20% d) 25%

$$\rightarrow \text{Profit \%} = \frac{1440 - 1200}{1200} \times 100 = \frac{240}{12} 20 \\ = 20\% \quad (\text{c})$$

- 3) If the SP of an item is ₹ 960 & CP is ₹ 800, what is profit %? a) 15% b) 20% c) 25% d) 30%

$$\rightarrow \text{Profit \%} = \frac{960 - 800}{800} \times 100 = \frac{160}{8} 20 = 20\% \quad (\text{b})$$

- 4) A shopkeeper sells a fan at ₹1200 with a loss of 20%. Find the C.P.
 a) ₹1400 b) ₹1500 c) ₹1600 d) ₹1700

$$\rightarrow \text{Loss \%} = \frac{\text{CP} - \text{SP}}{\text{CP}} \times 100$$

$$20\% = \frac{\text{CP} - 1200}{\text{CP}} \times 100$$

$$\frac{1}{5} \text{CP} = \text{CP} - 1200$$

$$1200 = \text{CP} - \frac{1}{5} \text{CP} \Rightarrow 1200 = \frac{4}{5} \text{CP}$$

$$\therefore \text{CP} = 300 \times 5 = 1500 \quad (\text{b})$$

- 5) If the C.P. of an article is ₹400 & it is sold for ₹480, what is profit %?
 a) 15% b) 20% c) 25% d) 30%

$$\rightarrow \text{Profit \%} = \frac{480 - 400}{400} \times 100 = \frac{80}{4} = 20\% \quad (\text{b})$$

- 6) A trader gives two successive discounts of 20% & 10%. Find the net discount %.
 a) 28% b) 30% c) 32% d) 36%

$$\rightarrow \text{Let marked price be ₹100.}$$

$$\text{1st disc: } 100 - 20\% \text{ of } 100 = 100 - 20 = 80$$

$$\text{2nd disc: } 80 - 10\% \text{ of } 80 = 80 - 8 = 72$$

$$\text{Net discount} = 100 - 72 = 28$$

$$\text{Net disc \%} = \frac{\text{Net disc}}{\text{MP}} \times 100 = \frac{28}{100} \times 100 = 28\% \quad (\text{a})$$

- 7) A man sold a shirt for ₹800 after giving a 20% discount. Find the M.P.
 a) ₹900 b) ₹1000 c) ₹1100 d) ₹1200

$$\rightarrow \text{Disc \%} = \frac{\text{Disc}}{\text{M.P.}} \times 100 \Rightarrow \frac{20}{\text{M.P.}} \times 100 = \frac{\text{M.P.} - 800}{\text{M.P.}}$$

$$\frac{20}{100} \times \text{M.P.} = \text{M.P.} - 800$$

$$\frac{1}{5} \text{M.P.} = \text{M.P.} - 800 \Rightarrow 800 = \text{M.P.} - \frac{1}{5} \text{M.P.}$$

$$\therefore 800 = \frac{4}{5} \text{M.P.}$$

$$5 \times 200 = \text{M.P.} \Rightarrow \text{M.P.} = 1000 \quad (\text{b})$$

- 8) A watch is sold for ₹1800 with a 25% profit. Find the C.P.
 a) ₹1200 b) ₹1300 c) ₹1400 d) ₹1500

$$\rightarrow \text{Profit \%} = \frac{1800 - \text{C.P.}}{\text{C.P.}} \times 100$$

$$\frac{25}{100} \times \text{C.P.} = 1800 - \text{C.P.}$$

$$1800 = \text{C.P.} + \frac{1}{4} \text{C.P.}$$

$$1800 = \frac{5}{4} \text{C.P.}$$

$$\text{C.P.} = \frac{1800}{5/4} = \frac{1800 \times 4}{5} = 360 \times 4 = ₹1440$$

$$\text{Markup} = \text{MP} - \text{CP}$$

$$\text{Markup \%} = \frac{(\text{Markup})}{\text{CP}} \times 100$$

- 9) A shopkeeper marks an article at ₹1500 and allows a 10% discount. Find the SP.
 a) 1300 b) 1350 c) 1400 d) 1450

$$\rightarrow \text{SP} = \text{MP} - 10\% \text{ MP}$$

$$= 1500 - 150$$

$$= 1350 \quad (\text{b})$$

- 10) A merchant buys 10 pens for ₹150 and sells them for ₹200. What is his profit %?

$$\rightarrow \text{Profit \%} = \frac{200 - 150}{150} \times 100 = \frac{50}{150} \times 100 = 33.\overline{3}\% \quad (\text{c})$$

- 11) A trades gives a 15% disc. on an item and still makes a profit of 20%. What is the markup %?

$$\text{a) } 30\% \quad \text{b) } 35\% \quad \text{c) } 40\% \quad \text{d) } 45\%$$

$$\rightarrow \text{Markup} = \text{MP} - \text{CP}$$

$$\text{Profit \%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 = 20 \quad | \quad \text{SP} = \text{MP} - d$$

$$| \quad \text{SP} = \text{MP} - 15\% \text{ MP}$$

$$\text{SP} - \text{CP} = \frac{20}{100} \text{ CP}$$

$$\text{SP} = \frac{6}{5} \text{ CP}$$

$$\text{MP} = d + \text{SP} \Rightarrow \text{CP} = \frac{5}{6} \text{ SP}$$

$$\text{Markup} = \text{MP} - \text{CP}$$

$$= \frac{20}{17} \text{ SP} - \frac{5}{6} \text{ SP} = \frac{120 - 85}{102} \text{ SP} = \frac{35}{102} \text{ SP}$$

$$\text{Markup \%} = \frac{\text{Markup}}{\text{CP}} \times 100 = \frac{35}{17} \times \frac{100}{102} = \frac{35}{17} \times \frac{100}{81} = \frac{3500}{1428} = 41.1 \approx 41\%$$

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- 12) A table is sold for ₹2250 at a 10% profit. What is the CP?

$$\rightarrow \text{Profit \%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$$

$$\frac{10}{100} \times \text{CP} = 2250 - \text{CP}$$

$$\frac{\text{CP}}{10} = 2250 - \text{CP}$$

$$\frac{11}{10} \text{ CP} = 2250$$

$$2045.4$$

$$\text{CP} = \frac{2250 \times 10}{11} = 2045.4 \approx (\text{d}) 2100$$

- 13) If a shopkeeper wants a profit of 25% on an item that costs ₹800, what should be the SP?

$$\rightarrow \text{Profit \%} = \frac{\text{SP} - 800}{800} \times 100$$

$$25 \times 8 = \text{SP} - 800$$

$$200 + 800 = \text{SP}$$

$$\text{SP} = 1000 \quad (\text{b})$$

- 14) A refrigerator is sold for ₹15000 at a loss of 10%. Find the CP.

$$\rightarrow \text{Loss \%} = \frac{15000 - \text{CP}}{\text{CP}} \times 100 \quad \text{Loss \%} = \frac{\text{CP} - 15000}{\text{CP}} \times 100$$

$$\frac{10}{100} \times \text{CP} = 15000 - \text{CP}$$

$$\frac{11}{10} \text{ CP} = 15000$$

$$\text{CP} = \frac{15000 \times 10}{11} = 1363.63$$

$$\text{CP} = \frac{15000 \times 10}{11} = 1363.63$$

$$\text{CP} = \frac{15000}{10} = 1500$$

$$\text{CP} = \frac{15000}{9} = 1666.67$$

$$\text{CP} = \frac{15000 \times 10}{9} = 16666.67$$

15) An article is marked 50% above the CP & then sold at 20% discount. What is profit %?

→ Let CP be 100

$$\therefore MP = 150$$

$$SP = 150 - 20\% \text{ of } 150 = 150 - 30 = 120$$

$$\text{Profit \%} = \frac{120 - 100}{100} \times 100 = 20\% \quad (a)$$

16) A dealer makes a profit of 12% after allowing a 5% discount. Find the MP of an article whose CP is ₹400.

$$\rightarrow \text{Profit \%} = \frac{SP - CP}{CP} \times 100$$

$$12 = \frac{SP - 400}{400} \times 100$$

$$48 = SP - 400$$

$$SP = 448$$

$SP = MP - 5\% \text{ of } MP$

$$448 = 95\% \text{ of } MP$$

$$MP = \frac{448 \times 100}{95} = \frac{44800}{95} = \approx 471$$

17) A book is bought for ₹480 & sold for ₹576. What is the Profit %?

$$\rightarrow \text{Profit \%} = \frac{576 - 480}{480} \times 100$$

$$= \frac{96}{480} \times 100 = 20\% \quad (c)$$

18) If a profit of ₹50 is made on an article whose CP is ₹500, what is profit %?

$$\rightarrow \text{Profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{550 - 500}{500} \times 100$$

$$= \frac{50}{500} \times 100$$

$$= \frac{10}{100} = 10\% \quad (c)$$

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

$$50 = SP - 500$$

$$500 + 50 = SP$$

$$SP = 550$$

19) A shopkeeper sells a cycle at a 15% profit and the SP is ₹2300. Find the CP.

$$\rightarrow \text{Profit \%} = \frac{2300 - CP}{CP} \times 100$$

$$= \frac{15}{100} \times CP = 2300 - CP$$

$$23 CP = 2300$$

$$20 CP = 2300$$

$$CP = \frac{2300 \times 20}{23} = 2000 \quad (b)$$

20) The CP of an article is ₹750 and it is sold at ₹900. What is the gain %?

$$\rightarrow \text{Gain \%} = \frac{900 - 750}{750} \times 100 = \frac{150}{750} \times 100 = 20\% \quad (c)$$

21) A man sells an item at a 20% loss. If SP is ₹640, find CP.

$$\rightarrow \text{Loss \%} = 20 = \frac{CP - 640}{CP} \times 100$$

$$20 \times CP = CP - 640 \Rightarrow 640 = CP - \frac{1}{5} CP$$

$$640 \times 5 = 5CP \Rightarrow 3200 = 5CP \Rightarrow CP = \frac{3200}{5} = 640 \quad (c)$$

22) A trader sells a mobile phone for ₹ 9600 at a profit of 20%. Find the CP.

$$\rightarrow \text{Profit \%} = 20 = \frac{9600 - CP}{CP} \times 100$$

$$\frac{20}{100} \times CP = 9600 - CP$$

$$9600 = 8CP$$

$$CP = \frac{9600 \times 5}{1600} = 8000 \text{ (b)}$$

23) A shopkeeper sells an item for ₹ 500 at a 20% profit. What is CP?

$$\rightarrow \text{Profit \%} = 20 = \frac{500 - CP}{CP} \times 100 = 20$$

$$\frac{120}{100} CP = 500 - CP$$

$$500 = 6CP$$

$$CP = \frac{500 \times 5}{250} = 1250 = 46.66 \approx (c)$$

24) A man buys two articles for ₹ 1500 each. He sells one at a 20% profit & the other at a 10% loss. Find his net profit / Loss.

$$\rightarrow \text{Profit \%} = 20 = \frac{SP - 1500}{1500} \times 100$$

$$300 + 1500 = SP \Rightarrow SP = 1800 \therefore \text{Profit} = 300$$

$$\text{Loss \%} = 10 = \frac{1500 - SP}{1500} \times 100$$

$$SP = 1500 - 150 = 1350 \Rightarrow SP = 1350 \therefore \text{Loss} = 150$$

$$\text{Net Profit} = 300 - 150 = 150$$

$$\therefore \text{Profit \%} = \frac{150}{300} \times 100 = 50\%$$

25) A trader sells an article at ₹ 1250 with a loss of 12%. Find the CP.

$$\rightarrow \text{Loss \%} = 12 = \frac{CP - 1250}{CP} \times 100$$

$$\frac{12}{100} \times CP = CP - 1250$$

$$1250 = CP - \frac{12}{100} CP = \frac{88}{100} CP$$

$$CP = \frac{1250 \times 100}{88} = \frac{625 \times 25}{44} = \frac{625 \times 25}{56.25} = 1375 \approx (b)$$

26) Find the profit percent earned after selling an article at a doubled rate for half quantity.

→ Let the article be of 2 parts & the total price be 100, after selling 1 part for 200,

$$\text{Profit \%} = \frac{200 - 100}{100} \times 100 = 100\% \quad 100 \times 2 = 200\% \quad (b)$$

27) A no. is multiplied by 20% of itself, the sum is then doubled. If the final value is 490, find the number.

→ Let the no. be 'n'

$$\therefore n \times \frac{20}{100} n \rightarrow \left[n \times \frac{20}{100} n \right] \times 2 = 490$$

$$n^2 (0.4) = 490$$

$$n^2 = 4900$$

$$n = \sqrt{\frac{4900}{4}} = \frac{70}{2} = 35 \quad (a)$$

28) An article is sold at 20% loss than its CP. If the selling cost is 50 Rs. & selling cost is 5% of the SP, find the loss. (Selling cost here is the expense occurred to sell the article, it is levied on the seller).

$$\rightarrow SP = CP - \frac{20}{100} CP = \frac{80}{100} CP$$

$$S.C. = 50$$

$$SC = \frac{5}{100} \times SP \rightarrow 50 = \frac{5}{100} \times SP$$

$$SP = \frac{50 \times 100}{5} = 100$$

$$CP = 100, SP = \frac{5}{100} \times 100 = 50$$

$$\therefore Loss = CP - SP = 1250 - 1000 = 250$$

29) If the seller sells half of his goods at 20% loss and the rest of his goods at 50% profit, find the profit % on the entire transaction.

\rightarrow Let the total goods cost ₹100.

Selling 50% for 20% Loss means, CP for it will be

$$Loss \% = \frac{20}{100} = \frac{SP - 50}{50} \times 100\%, 20 = \frac{SP - 50}{50} \times 100$$

$$SP = 50 + 10 = 60 \quad SP = 50 - 10 = 40$$

Selling rest at 50% profit means,

$$Profit \% = \frac{50}{25} = \frac{SP - 50}{50} \times 100\%,$$

$$SP = 50 + 25 = 75$$

$$\begin{aligned} \therefore Total profit &= Total SP - Total CP \\ &= (75+40) - (50+50) \\ &= 115 - 100 \\ &= 15 \end{aligned}$$

$$\therefore Profit \% = \frac{15}{100} \times 100 = 15\% \quad (b)$$

30) The expense of selling an article worth ₹6000 is ₹50. If the selling expense is 10% more than the loss, find loss %.

$$\rightarrow CP = 6000$$

$$Loss = CP - SP$$

$$S.E. = 50 = Loss + 10\% Loss$$

$$50 = \frac{110}{100} Loss = \frac{110}{100} (6000 - SP)$$

$$50 \times 100 = 6000 - SP \Rightarrow \frac{5000}{11} + SP = 6000$$

$$SP = 6000 - \frac{500}{11} \Rightarrow SP = 66000 - 500$$

$$SP = 65500 = 5954.54$$

$$\begin{aligned} Loss \% &= \frac{CP - SP}{CP} \times 100 = \frac{6000 - 5954.54}{6000} \times 100 \\ &= \frac{45.46}{6000} \approx 0.75\% \end{aligned}$$

31) The profit on selling 1 article is equal to the cost price of 2 such articles. Find profit %.

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

$$\text{Profit} = 2CP \quad (\text{i}) \text{ Accn to question}$$

$$\therefore 2CP = SP - CP$$

$$CP = \frac{SP - CP}{2} \quad 3CP = SP$$

$$CP = \frac{SP}{3}$$

$$\text{Profit \%} = \frac{SP - CP}{CP} \times 100 = \frac{2CP}{CP} \times 100 = 200\% \quad (\text{c})$$

32) The initial price of an article is decreased by 20% but the SP remains constant. If the initial profit was ₹500, find the new profit.

$$\rightarrow \text{Initial Profit \%} = \frac{SP - CP}{CP} \times 100 = 20\% \text{ of } CP$$

$$\frac{500}{CP} \times 100 = \frac{20}{100} CP$$

$$250000 = CP^2 \quad | \quad SP = 500 + CP$$

$$CP = 500 \quad | \quad SP = 1000$$

Initial CP is decreased by 20%:

$$\text{New CP} = 500 - 20\% \text{ of } 500$$

$$= 500 - 100$$

$$= 400$$

$$\text{Profit \%} = \frac{1000 - 400}{400} \times 100 \quad | \quad \text{Profit} = 600$$

$$= \frac{600}{4} = 150\%$$

33) The price of a pair of slippers is decreased by 10% & the SP is constant. If the initial profit % was equal to 25%, find new profit %.

$$\rightarrow \text{Initial Profit \%} = \frac{\text{Profit}}{CP} \times 100 = 25$$

$$\text{Profit} = 1 \Rightarrow \frac{SP - CP}{CP} = \frac{1}{4}$$

$$4(SP - CP) = CP$$

$$4SP = 5CP$$

$$SP = \frac{5CP}{4}$$

$$\text{New Profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{SP - \frac{90CP}{100}}{\frac{90CP}{100}} \times 100 = \frac{\frac{5CP}{4} - \frac{9CP}{10}}{\frac{9CP}{10}} \times 100$$

$$= \frac{25CP - 18CP}{20} \times 100 = \frac{7CP}{20} \times \frac{100}{9CP} = \frac{7 \times 50}{9} = 350$$

$$\text{Profit \%} = 38.8\% \quad (\text{b})$$

34) The CP of an article is doubled & the SP is made half. If the initial profit % was 500%, find the profit % now.

$$\rightarrow \text{Initial Profit \%} = \frac{SP - CP}{CP} \times 100 = 500\% \quad | \quad \text{Now, Profit \%} = \frac{SP - 2CP}{2CP} \times 100$$

$$\frac{SP - CP}{CP} = 5 \quad | \quad \frac{SP - 2CP}{2CP} = \frac{3CP - 2CP}{2CP} \times 100$$

$$SP - CP = 5CP \quad | \quad SP = 6CP$$

$$= \frac{CP}{2CP} \times 100 = 50\% \quad (\text{b})$$

35) A shopkeeper increases the price of sugar by 25%. By how much a family should decrease their consumption to maintain the regular price?

$$\rightarrow 100 \rightarrow 125$$

Initially 1 kg $\rightarrow 100$ ₹

Now, 1 kg $\rightarrow 125$ ₹

So, 2 kg $\rightarrow 100$ ₹

$$\therefore x = \frac{100}{125} \times 100\% = 80\% \text{ sugar}$$

means 20% decrease in consumption (d)

* 36) The profit on selling 15 articles is equal to the CP of 2 articles. Find profit %.

\rightarrow Let's Price of 2 articles be 200

$$\text{Profit \%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100$$

Let the CP for 15 articles = 15C

$$\text{SP} = 15S$$

$$\therefore \text{Profit} = 15S - 15C$$

$$\text{Acc}^n \text{ to the q: Profit} = 2C$$

$$\therefore 15S - 15C = 2C$$

$$\therefore 15S = 17C \quad \therefore S = \frac{17C}{15}$$

$$\begin{aligned} \text{Profit \%} &= \frac{3P - CP}{CP} \times 100 = \frac{\text{Profit on 1 article}}{\text{CP of 1 article}} \times 100 \\ &= \frac{2C}{15} \times 100 = \frac{2}{15} \times 100 = 200\% \\ &= \frac{40}{2} = 13.33\dots \text{ (c)} \end{aligned}$$

37) 40% of a no. a is 50% of a no. b, find the value of a : b.

$$\rightarrow \frac{40}{100} a = \frac{50}{100} b$$

$$\therefore a = \frac{5}{4} b$$

38) The MP of an article is 5 times the discount. Find the SP in terms of discount.

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

$$\therefore \text{MP} = 5 \text{ Discount}$$

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

$$= 5 \text{ discount} - \text{discount}$$

$$\text{SP} = 4 \text{ discount} \quad (\text{c})$$

39) Solve for x: $x = 20\% \text{ of } 12\% \text{ of } 120\% \text{ of } 6250$

$$\rightarrow \frac{60}{100} \times \frac{12}{100} \times \frac{120}{100} \times 6250 = \frac{60 \times 12 \times 120}{100 \times 100 \times 100} \times 6250$$

$$\therefore 12 \times \frac{60}{100} \times \frac{12}{100} \times \frac{120}{100} \times 6250 = 12 \times 3 \times 25$$

$$20 \times \frac{3}{100} \times \frac{12}{100} \times \frac{120}{100} \times 6250 = 180 \quad (\text{d})$$

40) A shopkeeper purchased an article for ₹500. At what price should he mark the article, to allow a discount of 35% & still earn 100% profit.

$$\rightarrow \text{Profit \%} = 100 = \frac{\text{SP} - 500}{500} \times 100 \Rightarrow 500 + 500 = \text{SP} = 1000$$

$$\rightarrow \text{MP} - \frac{x}{100} \text{ MP} = 1000 \Rightarrow (100 - x)\text{ MP} = 1000$$

Discount = 35%

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

$$MP - 35\% \text{ of } MP = 1000$$

$$\frac{65}{100} MP = 1000$$

$$MP = \frac{1000 \times 100}{65} = \frac{20000}{13}$$

$$MP = 1538.4 \approx 1539 \quad (a)$$

- 41) A is 25% more than B. By what % is B smaller than A?

$$A \rightarrow 125$$

$$B \rightarrow 100$$

$$\therefore \frac{255}{125} \times 100\% = 20\% \text{ smaller} \quad (b)$$

- 42) If the discount is twice the CP & the MP is 10000, find SP. No profit or loss was made.

$$\rightarrow \text{Discount} = MP - SP \Rightarrow D = 10000 - SP$$

$$\text{Discount} = 2CP \quad 2CP = 10000 - SP$$

$$\frac{10000}{2} = CP$$

$$3SP = 10000$$

$$SP = \frac{10000}{3} = 3333.33$$

$$5000 - CP = SP \quad (\text{As no P & L}) \quad (b)$$

- 43) The CP of an article is 30% less than the SP.

The discount is 40% of SP. If MP is 12600, find CP.

$$\rightarrow CP = \frac{70}{100} SP, \quad D = 0.4SP$$

$$MP = D + SP = 0.4SP + SP = 12600$$

$$1.4SP = 12600$$

$$SP = \frac{12600}{1.4} = 9000 \Rightarrow CP = \frac{70}{100} \times 9000 = 6300$$

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- 44) If 33.33% of a no. is 20 more than 16.66% of the no., find 120% of the no.

$$\frac{100}{3} \% \text{ of } x = \frac{100}{6} \% + 20$$

$$\frac{100}{3} x = \left(\frac{100+20}{6} \right) \times \frac{9}{100}$$

$$x = \frac{1}{2} + \frac{20}{5} = \frac{5+6}{10} = \frac{11}{10}$$

$$\therefore 120\% \text{ of } x = \frac{120}{100} \times \frac{11}{10} = \frac{132}{100} = 1.32$$

$$\frac{1}{3} x = \frac{1}{6} x + 20$$

$$\frac{1}{3} x - \frac{1}{6} x = 20 \Rightarrow \frac{x}{6} = 20 \Rightarrow x = 120$$

$$\therefore 120\% \text{ of } 120 = \frac{120}{100} \times 120 = 144 \quad (c)$$

- 45) Find the no. if 20% of a no. is 20 more than 20% of another no. 20.

$$\rightarrow \frac{1}{5} x = 20 + \frac{1}{5} \times \frac{20}{8} \Rightarrow \frac{1}{5} x = 24$$

$$x = 24 \times 5 \Rightarrow x = 120 \quad (c)$$

- 46) A no. if doubled, then tripled and this process is repeated twice. What is % change?

→ Let the no. be 100,

$$100 \times 2 = 200 \Rightarrow 200 \times 3 = 600$$

$$600 \times 2 = 1200 \Rightarrow 1200 \times 3 = 3600$$

$$3600 \times 2 = 7200 \Rightarrow 7200 \times 3 = 21600$$

$$\therefore \% \text{ change} = \frac{21600 - 100}{100} \times 100 = 21500\%$$

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47) By how much should 234 be reduced to make it 65% of itself?

$$234 - x = \frac{65}{100} \times 234$$

$$x = 234 - \frac{65}{100} \times 234$$

$$= 234 \left(1 - \frac{65}{100}\right) = 234 \times \frac{35}{100}$$

$$x = 81.9 \quad (\text{b})$$

48) What is 90% of 900% of 9000% of 9?

$$\frac{9000}{100} \times 9 = 810$$

$$\frac{900}{100} \times 810 = 7290$$

$$\frac{90}{100} \times 7290 = 6561 \quad (\text{d})$$

49) Out of 25 employees of a company, 13 are set off (laid off) and the salaries of rest of the employees are increased by 24%. Find the total increase or decrease in the company's expenditure.

→ Initially, let sal. of 1 emp be S , so for 25 emp = $25S$

$$\text{Initial exp.} = 25S$$

After layoff, if no salary change occurred, exp = $12S$

$$\text{Salary increase for rest} = 12S + \frac{24}{100} \times 12S = 37.2S = 14.88S$$

$$\therefore \text{change in exp} = 25S - 37.2S = \left(\frac{62.5 - 37.2}{25}\right)S = \frac{25.3}{25}S$$

$$\% \text{ change in exp} = \frac{10.128}{25S} \times 100\% = 40.58\% \text{ decrease}$$

(a)

50) Zain bought tickets to concert for ₹ 3500. He wants to sell them at a discount of 15%. What is the discount in ₹?

$$\text{Discount} = 3500 - \frac{15}{100} \times 3500$$

$$SP = 3500 - 525$$

$$SP = 2975$$

$$\text{discount} = 525 \quad (\text{c})$$

$$\begin{array}{r} 35 \\ \times 15 \\ \hline 175 \\ 350 \\ \hline 525 \end{array}$$

$$\begin{array}{r} 3500 \\ \times 15 \\ \hline 1750 \\ 3500 \\ \hline 5250 \end{array}$$

$$\begin{array}{r} 5250 \\ - 525 \\ \hline 2975 \end{array}$$