

1] What is 25% of 200?

$$\rightarrow \frac{25}{100} \times 200 = 50$$

Percentage means /100 means $\frac{25}{100} = \frac{1}{4}$
Means 25% of any number is same as dividing the number by 4 i.e. $\frac{200}{4} = 50$

2] If 40% of a number is 80, what is the number?

$$\rightarrow 40\% \text{ of } x \text{ (number)} = 80$$
$$\frac{40}{100} \times x = 80$$
$$x = \frac{80 \times 100}{40}$$
$$x = 200$$

Trick number = $\frac{(\text{Given no} \times 100)}{\text{Percentage}}$

3] 75% of a number is 150, what is the number?

→ Assume x is a number.

$$\frac{75}{100} \times x = 150$$
$$x = \frac{150 \times 100}{75}$$
$$x = 200$$

4] What is 15% of 200?

$$\rightarrow \frac{15}{100} \times 200 \left(\frac{15}{100} \times 200 = \frac{180}{10} = 18 \right)$$
$$= 18$$

5] If 30% of a number is 90, then the number is?

→ Assume x is a number.

$$\frac{30}{100} \times x = 90$$
$$x = \frac{90 \times 100}{30}$$
$$x = 300$$

6) The price of product increases from ₹3200 to ₹3250, what is percentage.

→ More price increase means : $250 - 200 = 50$ ₹

So 50% Price is increase

$$= \frac{50}{200} \times 100$$

$$= 25\%$$

formula : $\frac{\text{Increase Price}}{\text{Original Price}} \times 100$

7) A salary increase from ₹40000 to ₹50000 what is percentage.

→ Increased price = $50000 - 40000 = 10000$

$$= \frac{10000}{40000} \times 100$$

$$= 25\% (\text{Increased})$$

8) The population of town decreased from 10,000 to 8000, what is decrease percentage?

→ Decrease population = $10000 - 8000 = 2000$

$$\text{Percentage decreased} = \frac{2000}{10000} \times 100$$

$$\text{Percentage decreased} = 20\%$$

9) A book price drop from ₹500 to ₹400, what is decreased percentage?

→ decreased book price = $500 - 400 = 100$
 $= \frac{100}{500} \times 100$

$$\text{Percentage decreased} = 20\%$$

10] If the cost price of an item is ₹600 and selling price is ₹450 what is percentage loss?

$$\rightarrow \text{loss} = \text{cost price} - \text{selling price}$$

$$= 600 - 450$$

$$= 150$$

$$= \frac{150}{600} \times 100$$

Percentage loss = 25%

11] What is greater : 30% of 400 or 40% of 300?

$$\bullet 30\% \text{ of } 400 = \frac{30}{100} \times 400 = 120$$

$$\bullet 40\% \text{ of } 300 = \frac{40}{100} \times 300 = 120$$

(c) Both of equals

12] A person spend 60% of his income and save ₹8000, what is his total income?

$$\rightarrow \text{Total salary percentage} = 100\% - 60\% \\ = 40\%$$

$$\text{Saving} = 40\%$$

Assume total income is x .

$$\frac{40}{100} \times x = 8000$$

$$x = \frac{8000 \times 100}{40}$$

Total income = 20,000 RS

13] If A is 20% more than B, then B is how much less than A?
→ Let assume B is = 100%

$$\text{A is 20% more than B means} = 100 + 20 \\ = 120\%$$

$$= \frac{20}{120} \times 100$$

B is less than A = 16.67%

14) If the price of sugar is increased by 25%, by how much should be consumption be reduced to maintain the same expense?

$$\rightarrow \text{Percentage decrease in consumption} = \frac{x}{100+x} = 100$$

$$= \frac{25}{100+25} \times 100$$

$$= \frac{\text{Increased \%}}{100 + \text{Increased \%}} \times 100$$

$$= \frac{25}{125} \times 100$$

Consumption reduced = 20%

15) If 'A' income is 40% more than 'B', then B income is what percentage less than A?

\rightarrow Let Assume B income = 100%

$$\begin{aligned} A \text{ income is } 40\% \text{ more than } B &= 100 + 40 \\ &\approx 140\% \end{aligned}$$

$$\text{Percentage less of A} = \frac{40}{140} \times 100$$

Percentage less of A = 28.57%

16) The price of an item is increased by 20% and then decreased by 10%. What is the net percentage change?

\rightarrow Assume increased price 20% = a.

Decreased Price of item by 10% = b.

$$\text{Net percentage change} = a + b + \frac{ab}{100}$$

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

$$= 20 - 10 - 2$$

$$= 8$$

Net % = 8% increase

17] A number is increased by 30% and then decreased by 20%. What is the final percentage change?

→ a = 30% increase

b = 20% decrease

$$\therefore a+b + \frac{ab}{100}$$

$$(30) + (-20) + \frac{(30 \times 20)}{100}$$

$$= 30 - 20 + \left(\frac{-600}{100} \right)$$

$$= 30 - 20 - 6$$

$$= 30 - 26$$

Final percentage = 4% Increase

18] If the population of a city increase by 25% and then decrease by 20%. what is the net percentage change.

→ a = 25% increased

b = 20% decreased

$$= a+b + \frac{ab}{100}$$

$$= (25) + (-20) + \left(\frac{(25) \times (-20)}{100} \right)$$

$$= 25 - 20 + \left(\frac{-500}{100} \right)$$

$$= 25 - 20 - 5$$

$$= 25 - 25$$

Net percentage = 0% no change.

19] If price increase by 40% and then decrease by 30%, the final change is.

→ a = 40% increase

b = 30% decrease

$$= a+b + \left(\frac{ab}{100} \right)$$

$$= (40) + (-30) + \left(\frac{(40) \times (-30)}{100} \right)$$

$$= 40 - 30 + \left[\frac{-1200}{100} \right]$$

$$= 40 - 30 - 12$$

$$= -2$$

Final percentage = 2 decrease

20) The salary of a person is first increased by 20% and then decreased by 10%, what is the overall percentage change.

→ $a = 20\%$ increased

$b = 10\%$ decreased.

$$= a+b+\left[\frac{a \times b}{100}\right]$$

$$= (20)+(-10)+\left[\frac{(20) \times (-10)}{100}\right]$$

$$= 20-10+\left[\frac{-200}{100}\right]$$

$$= 20-10-2$$

$$= 20-12$$

Overall percentage = 8% increased

21) If an article is sold at a profit of 25%, then the selling price is what percentage of the cost price?

→ Total cost price is = 100%

$$= 100 + 25\% \text{ of CP.}$$

$$= 125\%$$

Selling price = 125%

22) A shopkeeper allows a discount of 10% on the marked price and still makes a profit of 8%. If the marked price is ₹ 500, what is the cost price?

→ discount = 10% of marked price = total discount = 10

$$\text{marked price} = ₹ 500$$

$$= 100 - 10$$

$$= 90$$

Selling price = 90%

$$= \frac{90}{100} \times 500$$

$$S.P = 450$$

- Still make profit of 8% so (when profit increase add +2)
- (when profit decrease -2)

$$S.P = C.P + \text{profit of CP}$$

$$450 = C.P + 8\% \text{ of C.P.}$$

$$450 = C.P + \left(\frac{8}{100} + 1\right) [\text{present full cost price } 200\%]$$

$$450 = C.P + 1.08$$

$$\frac{450}{1.08} = C.P$$

$$416.67 = C.P$$

$$CP = 416.67 \cong 420$$

23] If the profit is 20% of the cost price, then what is the profit percentage on selling price?

→ Total cost price is assume = 100%

$$20\% \text{ profit of the cost price} = 100 + 20$$

$$S.P = 120$$

$$= \frac{20}{120} \times 100$$

$$= \frac{2000}{120}$$

Profit % = 16.67% based on S.P

24] A product is marked at ₹ 1200 and sold for ₹ 960, what is the percentage?

$$\text{Discount} = \frac{\text{Marked price} - \text{Selling Price}}{\text{Marked Price}} \times 100$$

$$= \frac{1200 - 960}{1200} \times 100$$

$$= \frac{240}{1200} \times 100$$

Discounts = 20%

25] If an article is brought for ₹ 500 and sold for ₹ 650; what is the percentage profit.

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

$$= \frac{650 - 500}{500} \times 100$$

$$= \frac{150}{500} \times 100$$

$$= 30\%$$

Percentage Profit = 30%

26] If 'A' income is 20% more than 'B', then 'B' income is what percentage less than A's?

→ Assume Percentage of B = 100%

$$\begin{aligned}\text{Percentage of A is 20% more than } &= B + 20\% \\ &= 100 + 20 \\ &= 120\end{aligned}$$

$$\text{Percentage decrease} = \frac{20}{120} \times 100$$

$$\boxed{\text{Percentage decrease.} = 16.67\%}$$

27] If the ratio of boys to girls is 3:2 what percentage are boys?

→ Total parts = 3+2
= 5

$$\begin{aligned}\text{Percentage of boys.} &= \frac{\text{boys}}{\text{total no}} \times 100 \\ &= \frac{3}{5} \times 100\end{aligned}$$

$$\boxed{\text{Percentage of boys.} = 60\%}$$

28] Population increased from 2,00,000 to 2,50,000, find the percentage increase.

$$\begin{aligned}\rightarrow \text{Percentage increase} &= 250,000 - 200,000 \\ &= 50,000 \\ &= \frac{50,000}{250,000} \times 100\end{aligned}$$

$$\boxed{\text{Percentage increase} = 25\%}$$

29] A candidate win by 3,000 votes with 65% votes, find total

→ candidate win by 65% votes, remaining 35% votes he loss

$$= 65 - 35$$

$$= 30\%$$

$$\text{Total votes} = \frac{3000}{30} \times 100$$

$$\boxed{\text{Total votes} = 10,000}$$

30] Price reduced by 30%, find required increase to restore.

→ Total price = 100%

reduce price = 30%

$$= 100 - 30$$

$$= 70\%$$

$$\text{required} = \frac{30}{70} \times 100$$

$$= 42.85\%$$

$$\boxed{\text{required} = (b) 42.85\%}$$

31] Number increased by 50%, find reflected then decrease by 50%, net change?

→ Assume $a = 50\%$

Assume $b = 50\%(-)$

$$\text{net change} = a+b+\frac{ab}{100}$$

$$= (50) + (-50) + \left[\frac{(50) \times (-50)}{100} \right]$$

$$= 50 - 50 + \left[\frac{2500}{100} \right]$$

$$= 50 - 50 - 25$$

$$= 50 - 75$$

$$\boxed{\text{net change} = -25 \text{ decrease}}$$

32] If A is 20% taller than B, B is shorter than A by:

→ Assume B is taller = 100%

A is 20% taller than B = 20%

$$= 100 + 20$$

$$= 120$$

$$B \text{ is taller by} = \frac{20}{120} \times 100$$

$$= 16.67\%$$

$$\boxed{B \text{ is taller shorter than A by} = 16.67\%}$$

33] 30% of a number is 90, find 60%

$$\rightarrow 30\% \text{ of a number is } 90 \text{ means.} = \frac{30}{100} = 0.30$$

$$= 0.30 \times \text{number} = 90$$

$$\text{number} = \frac{90}{0.30}$$

$$= 300$$

$$\therefore = \frac{60}{100} \times 300$$

$$\boxed{60\% = 180}$$

34] A person spends 75% and saves ₹ 5000, find total income.

\rightarrow Total income assume = 100

$$= 100 - 75 \text{ (spends)}$$

$$= 25\%$$

$$\text{Total income} = \frac{5000}{25} \times 100$$

$$= 5000 \times 4$$

$$\boxed{\text{Total income} = 20,000}$$

35] The price of Petrol increased by 20%. By what percentage should consumption be reduced to maintain the same Person?

$$\rightarrow \text{Required reduction} = \frac{-\text{increased \%}}{100 + \text{increased \%}} \times 100$$

$$= \frac{-(20)}{(100+20)} \times (100)$$

$$= \frac{(20)}{(120)} \times (100)$$

$$\boxed{\text{Percentage} = 16.67\%}$$

16.67%

18%

20%

25%

36] The price of a TV was first increased by 20% and then decreased by 10%, what is the overall percentage change?

- a) 8% increase
- b) 10% increase
- c) 10% decrease
- d) No change

→ Solution:

assume $a = 20\%$ increase

assume $b = 10\%$ decrease

$$\text{Overall percentage} = a + b + \frac{ab}{100}$$

$$= (20) + (-10) + \left[\frac{(20)(-10)}{100} \right]$$

$$= 20 - 10 + \left[\frac{-200}{100} \right]$$

$$= 20 - 10 - 2$$

Overall percentage = 8% increase

37] A shopkeeper marks an items 25% above the cost price and give a 20% discount, what is his profit/loss percentage?

- a) 0%
- b) 2% profit
- c) 5% profit
- d) 10% loss

→ Solution:

Assume cost price is = 100

marking on items = 25%

$$= 100 + 25$$

$$= 125$$

$$\text{Percentage discount} = \frac{20}{100} \times 125$$
$$= 25$$

$$\text{dis. percentage} = (125 - 25)$$

$$\begin{aligned} &= 100 \\ \text{Buying price} &= \text{cost price} \\ &= 0\% \end{aligned}$$

32 If the cost price of an article is ₹ 200 and it is sold at a loss
at 20%, calculate its new selling price.

- a) ₹ 250
- b) ₹ 315
- c) ₹ 400
- d) ₹ 450

→ Solution:

$$\text{Loss at } 20\% \text{ of } 200 = \frac{20}{100} \times 200$$

$$\text{Loss} = 40$$

$$\begin{aligned}\text{Selling price} &= (\text{cost price} - \text{loss}) \\ &= (200 - 40)\end{aligned}$$

$$\boxed{\text{Selling price} = ₹ 160}$$

33 If a salary is increased by 10% and then decreased by
10% what is final percentage change.

- a) 0%
- b) 1% increased
- c) 1% decreased
- d) 2% increased

→ Solution:

assume, $a = 10\%$ increase (+)

assume, $b = 10\%$ decrease (-)

$$\text{Final percentage change} = a + b + \frac{ab}{100}$$

$$= (10) + (-10) + \left[\frac{(10)(-10)}{100} \right]$$

$$= 10 - 10 + \left[\frac{-100}{100} \right]$$

$$= 10 - 10 - 1$$

$$= 10 - 1$$

$$\boxed{\text{Final percentage change} = -1\% \text{ decreased}}$$

40] A student needs 40% marks to pass, he gets 200 marks and fails 20 marks, what are the total marks?

a) 500

b) 550

c) 600

d) 650

Solutions:

He gets 200 marks. $\therefore 200$

And need to fail 20 marks $\therefore 20$

$= 200 + 20$ (which is 40% to pass)

$= 220$

Assume Total marks $= \frac{40}{100} \times 220 = x$.

$$\frac{40}{100} \times x = 220$$

$$x = \frac{220 \times 100}{40}$$

$$x = 550$$

41] A man spends 20% of his salary on rent, 30% on food, and 10% on transport, if he saves ₹ 18,000, what is his salary?

a) ₹ 40000

b) ₹ 45000

c) ₹ 50000

d) ₹ 55000

Solution:

Total spend $= 20\% + 30\% + 10\% = 60\%$

Total salary $= 100\% - \text{Spend}$

$$= 100 - 60$$

$= 40\%$ saving

Assume Total Salary x .

$$\frac{40}{100} \times x = 18000$$

$$x = \frac{18000 \times 100}{40}$$

$$x = 45000$$

42] The cost of an item is first increased by 30% and then decreased by 30%. What is the overall percentage change?

a) 0%

b) 9% decrease

c) 9% increase

d) 18% decrease

→ Solution:

Assume cost price = 100%

Increased C.P. = 30%

$$= 100 + 30$$

$$= 130\%$$

Decreased by 30% of cost price. = $\frac{30}{100} \times 130$

$$= 39\%$$

Final cost price = $130 - 39\%$

$$= 91\%$$

The overall CP is $= 100 - 91$ (final CP)

Overall change = 9% decrease

43] The population increased by 10% every year. If the current population is 10,000. What will it be in 3 years?

a) 13,310

b) 13,500

c) 14,000

d) 14,200

→ Solution

Current population is 10,000 increased by 10% every year

$$= \frac{10}{100} \times 10,000$$

$$= 1000 \text{ /yr.}$$

∴ New population is $= 10000 + 1000$

$$= 11000 \text{ /yr}$$

$$= \frac{10}{100} \times 11000$$

$$= 1100 \text{ (New yr)}$$

∴ New population = $10000 + 1100$

$$= 12100$$

$$= \frac{10}{100} \times 12100$$

$$= 1210$$

4) New population = $12100 + 1210$

after 3 yr = 13310 population becomes.

44) If 15% of A is equal to 20% of B, then A:B is

- a) 3:4
- b) 4:3
- c) 3:5
- d) 5:3

→ Solution :

$$15\% \text{ of } A = 20\% \text{ of } B$$

$$\frac{15}{100} * A = \frac{20}{100} * B$$

$$\frac{15}{100} * 100A = \frac{20}{100} * 100B$$

$$15A = 20B$$

$$A = \frac{20}{15} B$$

$$A = \frac{4}{3} B$$

$$A:B = 4:3$$

45) If the cost price of an item is ₹ 800 and the profit made is 25%, what is the selling price?

- a) ₹ 2900
- b) ₹ 1000
- c) ₹ 1050
- d) ₹ 1100

→ Solution :

$$\text{Cost Price} = ₹ 800$$

$$\text{made profit} = \text{addl } 4$$

$$\text{Selling Price} = CP \times (1 + \text{Profit})$$

$$= 800 \times \left(1 + \frac{25}{100}\right)$$

$$= 800 \times (1 + 0.25)$$

$$= 800 \times (1.25)$$

$$= ₹ 1000$$

$$\boxed{\text{Selling Price} = ₹ 1000}$$

46) If the cost price (CP) of an item is ₹200 and the selling price (SP) is ₹250, what is profit percentage.

- a) 20%
- b) 25%
- c) 30%
- d) 40%

→ Solution

$$\begin{aligned} \text{Profit} &= SP - CP \\ &= (250 - 200) \\ &= 50 \end{aligned}$$

$$\begin{aligned} \text{Percentage} &= \frac{50}{200} \times 100 \\ &= 25\% \end{aligned}$$

Profit Percentage = 25%

47) A man sells an article for ₹720 on a profit of 20%. Find the cost price.

- a) ₹600
- b) ₹620
- c) ₹650
- d) ₹700

→ Solutions :

$$\text{Profit} = 20\% \text{ of C.P. (1 add)}$$

$$\text{Selling Price} = \text{Cost Price} \times (1 + \text{Profit})$$

$$720 = \text{Cost Price} \times \left(1 + \frac{20}{100}\right)$$

$$720 = \text{Cost Price} \times (1 + 0.20)$$

$$720 = \text{Cost Price} \times (1.20)$$

$$\frac{720}{1.20} = \text{Cost Price}$$

$$600 = \text{Cost Price}$$

Cost Price = ₹600/-

48] A shopkeeper sells an items at a loss of 15%. If the cost price is ₹ 500, find the selling price.

→ a) ₹ 400

b) ₹ 425

c) ₹ 450

c) ₹ 475

→ Solution:

Selling items at loss = 15% (-ve add)

$$\text{Selling price} = \text{cost price} \times \left(1 - \frac{\text{loss}}{100}\right)$$

$$= 500 \times \left(1 - \frac{15}{100}\right)$$

$$= 500 \times (1 - 0.15)$$

$$= 500 \times 0.85$$

Selling price. = ₹ 425

49] A man purchased a cycle for ₹ 1500 and sold it at a loss of 10%; what was selling price?

a) ₹ 1200

b) ₹ 1300

c) ₹ 1350

c) ₹ 1400

→ Solution.

Loss = 10% (-ve add)

$$\text{Selling price} = \text{cost price} \times \left(1 - \frac{\text{loss}}{100}\right)$$

$$= 1500 \times \left(1 - \frac{10}{100}\right)$$

$$= 1500 \times (1 - 0.10)$$

$$= 1500 \times 0.90$$

$$= 1350 \text{ ₹}$$

Selling price = ₹ 1350

50) A trader marks his goods at 30% above the cost price and allow a discount of 10% : what is his gain percent?

a) 17%

b) 18%

c) 19%

d) 20%

→ Solution.

• Assume cost price = ₹100

marked price = 30%

$$= 100 + 30$$

$$= ₹130$$

• Allow discount of 10% = $\frac{10}{100} \times 130$

$$= ₹13$$

• selling price = ₹130 - ₹13

$$= ₹117$$

• calculate gain = S.P - C.P

$$= ₹117 - ₹100$$

$$= ₹17$$

• gain percentage = $\frac{17}{100} \times 100$

$$= 17\%$$

∴ gain percentage = 17%