

**Topic : Percentage & Profit & Loss question Bank**

**Deadline: Monday 10th March**

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1. What is 25% of 200?

- a) 25
- b) 50\
- c) 75\
- d) 100

**Ans: b)**

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

- a) 100\
- b) 150\
- c) 200\
- d) 250

**Ans: c)**

3. 75% of a number is 150. What is the number?

- a) 175
- b) 200
- c) 225\
- d) 250

**Ans: b)**

4. What is 15% of 120?

- a) 12\
- b) 15\
- c) 18\
- d) 20

**Ans.: c)**

5. If 30% of a number is 90, then the number is:\

- a) 200\
- b) 250\
- c) 300\
- d) 350

**Ans: c)**

6. The price of a product increases from ₹200 to ₹250. What is the percentage increase?\

- a) 20%\
- b) 25%\
- c) 30%\
- d) 35%

**Ans: b)**

7. A salary increases from ₹40,000 to ₹50,000. What is the percentage increase?\

- a) 20%\
- b) 25%\
- c) 30%\
- d) 35%

**Ans: b)**

8. The population of a town decreased from 10,000 to 8,000. What is the percentage decrease?\

- a) 10%\
- b) 15%\
- c) 20%\
- d) 25%

**Ans: c)**

9. A book's price drops from ₹500 to ₹400. What is the percentage decrease?\

- a) 10%\
- b) 15%\
- c) 20%\
- d) 25%

**Ans: c)**

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

- a) 20%\
- b) 22.5%\
- c) 25%\
- d) 30%

**Ans: c)**

1. ### \*\*Section 3: Percentage Comparison\*\*

11. Which is greater: 30% of 400 or 40% of 300?\

- a) 30% of 400\
- b) 40% of 300\
- c) Both are equal\

d) Cannot be determined

**Ans: c)**

12. A person spends 60% of his income and saves ₹8,000. What is his total income?\

- a) ₹15,000\
- b) ₹18,000\
- c) ₹20,000\
- d) ₹25,000

**Ans: c)**

13. If A is 20% more than B, then B is how much less than A?\

- a) 20%\
- b) 16.67%\
- c) 25%\
- d) 10%

**Ans.: b)**

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

- a) 20%\
- b) 25%\
- c) 30%\
- d) 15%

**Ans: a)**

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

- a) 28.57%\
- b) 30%\
- c) 33.33%\
- d) 40%

**Ans: a)**

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

- a) 8% increase\
- b) 8% decrease\
- c) 10% increase\
- d) 10% decrease

**Ans: a)**

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

- a) 4% increase\
- b) 8% increase\
- c) 10% increase\
- d) 12% increase

**Ans.: a)**

18. If the population of a city increases by 25% and then decreases by 20%, what is the net percentage change?\

- a) 0%\
- b) 5% increase\
- c) 10% decrease\
- d) 5% decrease

**Ans: a)**

19. If a price increases by 40% and then decreases by 30%, the final change is:\

- a) 2% increase\
- b) 10% increase\
- c) 10% decrease\
- d) 2% decrease

**Ans: d)**

20. The salary of a person is 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

**Ans: a)**

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

- a) 100%\
- b) 125%\
- c) 150%\
- d) 175%

**Ans: b)**

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?\

- a) ₹400\
- b) ₹420\

c) ₹450\

d) ₹460

**Ans: b)**

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

a) 16.67%\

b) 18%\

c) 20%\

d) 22%

**Ans: a)**

24. A product is marked at ₹1,200 and sold for ₹960. What is the percentage discount given?

a) 15%\

b) 20%\

c) 25%\

d) 30%

**Ans: b)**

25. If an article is bought for ₹500 and sold for ₹650, what is the percentage profit?

a) 20%\

b) 25%\

c) 30%\

d) 35%

**Ans: c)**

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

a) 16.67%

b) 18%

c) 20%

d) 25%

**Ans: a)**

27. If the ratio of boys to girls in a school is 3:2, what percentage of the total students are boys?

e) 30%

f) 40%

g) 50%

h) 60%

**Ans: h)**

28. A city's population increased from 2,00,000 to 2,50,000 in 2 years. What is the percentage increase?

- a. 20%
- b. 25%
- c. 30%
- d. 35%

**Ans: b)**

29 In an election, a candidate gets 65% of the total votes and wins by 3000 votes. How many total votes were cast?

- a. 5000
- b. 6000
- c. 8000
- d. 9000

**Ans: d)10000 correct answer**

30 The price of an article is reduced by 30%. By what percentage must the new price be increased to restore the original price?

- a. 30%
- b. 42.85%
- c. 50%
- d. 60%

**Ans: b)**

31 If a number is increased by 50% and then decreased by 50%, what is the net percentage change?

- a. 0%
- b. 25% decrease
- c. 50% decrease
- d. 75% decrease

**Ans: b)**

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

- a. 16.67%
- b. 18%
- c. 20%
- d. 25%

**Ans: a)**

33 If 30% of a number is 90, what is 60% of the same number?

- a. 120
- b. 150
- c. 180
- d. 200

**Ans: c)**

34 A person spends 75% of his income and saves ₹5000. What is his total income?

- a. ₹15,000
- b. ₹18,000
- c. ₹20,000
- d. ₹25,000

**Ans: c)**

35 The price of petrol increases by 20%. By what percentage should consumption be reduced to maintain the same expense?

- a. 16.67%
- b. 18%
- c. 20%
- d. 25%

**Ans: a)**

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

**Ans: a)**

37 A shopkeeper marks an item 25% above the cost price and gives a 20% discount. What is his profit/loss percentage?

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

**Ans: a)**

38 If the cost price of an article is ₹500 and it is sold at a loss of 20%, what is the selling price?

- a. ₹350
- b. ₹375
- c. ₹400
- d. ₹450

**Ans: c)**

39 If a salary is increased by 10% and then decreased by 10%, what is the final percentage change?

- a. 0%
- b. 1% decrease
- c. 1% increase
- d. 2% decrease

**Ans: b)**

40 A student needs 40% marks to pass. He gets 200 marks and fails by 20 marks. What are the total marks?

- a. 500
- b. 550
- c. 600
- d. 650

**Ans: b)**

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. ₹40,000
- b. ₹45,000
- c. ₹50,000
- d. ₹55,000

**Ans: b)**

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. 15% decrease

**Ans: b)**

43) The population of a town increases by 10% every year. If the current population is 10,000, what will it be after 3 years?

- a) 13,310
- b) 13,500
- c) 14,000
- d) 14,200

**Ans: a)**

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

**Ans: b)**

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

- a) ₹900
- b) ₹1000
- c) ₹1050
- d) ₹1100

**Ans: b)**

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

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

**Ans: b)**

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

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

**Ans: a)**

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

- a) ₹400
- b) ₹425
- c) ₹450
- d) ₹475

**Ans: b)**

49) A man purchased a cycle for ₹1500 and sold it at a loss of 10%. What was the selling price?

- a) ₹1200
- b) ₹1300
- c) ₹1350
- d) ₹1400

**Ans: c)**

50) A trader marks his goods at 30% above the cost price and allows a discount of 10%. What is his gain percent?

- a) 17%
- b) 18%
- c) 19%
- d) 20%

**Ans: a)**



## Profit & loss & percentage Question Bank

① What is 25% of 200?



$$25\% \text{ of } 200 = \frac{25}{100} \times 200 = 50$$

Ans = 50

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



$$40\% \text{ of } x = 80$$

$$\frac{40}{100} \times x = 80$$

$$x = \frac{80 \times 100}{40}$$

$$x = 200$$

$$x = 200$$

$$x = 200$$

③ 75% of a number is 150. What is the number?



$$75\% \text{ of } x = 150$$

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

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

$$= \frac{1500}{75}$$

$$x = 200$$



(4) What is 15% of 120?



$$15\% = \frac{15}{100}$$

Multiply by 120.

$$\frac{15}{100} \times 120 = \frac{15 \times 120}{100}$$
$$= \frac{1800}{100}$$

$$\boxed{15\% \text{ of } 120 \text{ is } 18}$$

(5) If 30% of a number is 90, then the number is



30% of a number = 90

$$30\% \text{ of } x = 90$$

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

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

$$x = \frac{9000}{30}$$

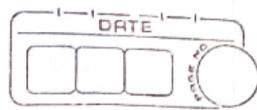
$$\boxed{x = 300}$$

(6) The price of product increases from ₹ 200 to ₹ 250  
What is the percentage increase?



Initial price = 200

New price = 250



Increase = New price - Initial price.

$$\begin{aligned} \text{Increase} &= 250 - 200 \\ &= 50 \end{aligned}$$

50/200 = 25% (Percentage Increase)

Calculate the percentage

$$\begin{aligned} \text{Percentage Increase} &= \left( \frac{\text{Increase}}{\text{Initial price}} \right) \times 100 \\ &= \frac{50}{200} \times 100 \\ &= 25\% \end{aligned}$$

- Q7 A salary increases from ₹40000 to ₹50000, what is the percentage increase?

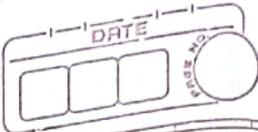
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$$\begin{aligned} \text{Initial salary} &= 40000 \\ \text{New salary} &= 50000 \end{aligned}$$

$$\begin{aligned} \text{Increase} &= \text{New salary} - \text{Initial salary} \\ &= 50000 - 40000 \\ &= 10000 \end{aligned}$$

Calculate the percentage

$$\begin{aligned} \text{Percentage Increase} &= \left( \frac{\text{Increase}}{\text{Initial salary}} \right) \times 100 \\ &= \left( \frac{10000}{40000} \right) \times 100 \\ &= \frac{1}{4} \times 100 \\ &= 25\% \end{aligned}$$



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

→

$$\text{Initial population} = 10,000$$

$$\text{New population} = 8,000$$

$$\text{Decrease} = \text{Initial population} - \text{New population}$$

$$= 10,000 - 8,000$$

$$= 2,000$$

calculate the percentage.

$$\text{percentage decrease} = \left( \frac{\text{Decrease}}{\text{Initial population}} \right) \times 100$$

$$= \left( \frac{2,000}{10,000} \right) \times 100$$

$$= 0.2 \times 100$$

$$= 20\%$$

- ⑨ A book's price drops from £500 to £400, what is the percentage decrease?

→

$$\text{Initial price} = 500$$

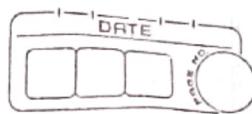
$$\text{New price} = 400$$

$$\text{Decrease} = \text{Initial Price} - \text{New Price}$$

$$= 500 - 400$$

$$= 100$$





calculate the percentage.

$$\text{Percentage Decrease} = \left( \frac{\text{Decrease}}{\text{Initial price}} \right) \times 100$$

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

$$= 0.2 \times 100$$

$$= 20\%$$

- 10) If the cost price of an item is ₹600 and the selling price is ₹450, what is the percentage loss.



$$\text{Cost price (CP)} = ₹600$$

$$\text{Selling price (SP)} = ₹450$$

$$\text{Loss} = \text{cost price} - \text{selling price}$$

$$= 600 - 450$$

$$= 150$$

calculate the percentage

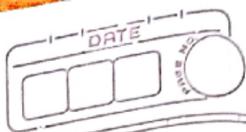
$$\text{Percentage Loss} = \left( \frac{\text{Loss}}{\text{cost price}} \right) \times 100$$

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

$$= 0.25 \times 100$$

$$= 25\%$$





(11) Which is greater : 30% of 400 or 40% of 300?

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

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

= Both are equal

(12) A person Spends 60% of his income and saves ₹ 8000. What is his total income?

→ 60% of income is spent

40% of income save

Saving amt is = ₹ 8000

40% of x is equal to ₹ 8000

$$40\% \times x = 8000$$

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

$$40x = 8000 \times 100$$

$$40x = 800000$$

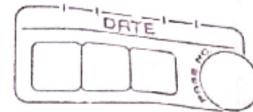
$$x = \frac{800000}{40}$$

$$x = 20000$$

(13) If A is 20% more than B, then B is how much less than A?

→ B = 100  
A is 20% more than B





$$\begin{aligned} A &= B + 20\% \text{ OF } B \\ &= 100 + \frac{20}{100} \times 100 \\ &= 100 + 20 \\ \boxed{A = 120} \end{aligned}$$

How much B less than A.

$$\begin{aligned} \text{percentage decrease} &= \left( \frac{A - B}{A} \right) \times 100 \\ &= \left( \frac{120 - 100}{120} \right) \times 100 \\ &= \left( \frac{20}{120} \right) \times 100 \\ &= \frac{2000}{120} \\ &= 16.67\% \end{aligned}$$

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

Original price of sugar = £100 per kg.

Original consumption = 100 kg.

$$\text{Total expenses} = 100 \times 100 = 10000$$

$$\text{New price} = 100 + \frac{25}{100} \times 100$$

$$\begin{aligned} &= 100 + 25 \\ &= 125 \text{ kg.} \end{aligned}$$

Find the New consumption

New price  $\times$  New consumption = old EXPENSE.

$$125 \times x = 10000$$

$$\frac{x}{125} = 10000$$

$$x = 80 \text{ kg}$$

Calculate the Reduction in Consumption

$$= \text{old consumption} - \text{New consumption}$$

$$= 100 - 80$$

$$= 20 \text{ kg.}$$

$$\text{Percentage reduction} = \left( \frac{20}{100} \right) \times 100$$

$$= 20\%$$

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

$$\rightarrow \text{B's income} = 100$$

A's income is 40% more than B's

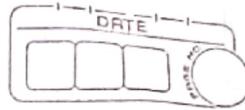
$$A = B + 40\% \text{ of } B$$

$$= 100 + \frac{40}{100} \times 100$$

$$= 140$$

How much B's income is less than A's.

$$\text{Percentage decrease} = \left( \frac{A - B}{A} \right) \times 100$$



$$= \left( \frac{140 - 100}{140} \right) \times 100$$

$$= \frac{40}{140} \times 100$$

$$= \frac{4000}{140}$$

$$= 28.57\%$$

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

Original price of item = 100

Apply the first change (increase by 20%)

$$\text{New price} = 100 + \frac{20}{100} \times 100$$

$$= 100 + 20$$

$$= 120$$

Apply the second change (Decrease by 10%)

$$\text{First price} = 120 - \frac{10}{100} \times 120$$

$$= 120 - 12$$

$$= 108$$

Calculate Net percentage change

$$\text{Net change} = \left( \frac{\text{Final price} - \text{Original price}}{\text{Original price}} \right) \times 100$$

$$= \left( \frac{108 - 100}{100} \right) \times 100$$

$$= \frac{8}{100} \times 100 = 8\%$$



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A number is increased by 30% and then decreased by 20%, what is the final percentage change?



$$\text{Original number} = 100$$

$$\begin{aligned}\text{New value} &= 100 + \left( \frac{30}{100} \right) \times 100 \\ &= 100 + 30 \\ &= 130\end{aligned}$$

$$\begin{aligned}\text{Final value} &= 130 - \left( \frac{20}{100} \right) \times 130 \\ &= 130 - 26 \\ &= 104\end{aligned}$$

$$\text{Net change} = \left( \frac{\text{final value} - \text{original value}}{\text{original value}} \right)$$

$$\begin{aligned}&= \left( \frac{104 - 100}{100} \right) \times 100 \\ &= \frac{4}{100} \times 100 \\ &= 4\%\end{aligned}$$

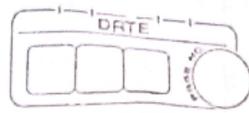
18

IF the population of a city increases by 25% and decreases by 20%, what is the net percentage



$$\text{Initial population} = 100$$

$$\begin{aligned}\text{New population} &= 100 + \frac{25}{100} \times 100 \\ &= 100 + 25 = 125\end{aligned}$$



$$\text{Final Population} = 125 - \frac{20}{100} \times 125$$
$$= 125 - 25$$
$$= 100$$

$$\text{Net change} = \left( \frac{\text{Final population} - \text{Initial population}}{\text{Initial population}} \right) \times 100$$
$$= \left( \frac{100 - 100}{100} \right) \times 100$$
$$= 0\%$$

- (19) If a price increases by 40% and then decreases by 30%, the final change is.

→

$$\text{Initial Price} = 100$$

$$\text{New Price} = 100 + \left( \frac{40}{100} \times 100 \right)$$
$$= 100 + 40$$

$$\text{Final Price} = 140 - \left( \frac{30}{100} \times 140 \right)$$
$$= 140 - 42$$
$$= 98$$

$$\text{Net change} = \left( \frac{\text{Final Price} - \text{Initial Price}}{\text{Initial Price}} \right) \times 100$$
$$= \left( \frac{98 - 100}{100} \right) \times 100$$
$$= \frac{-2}{100} \times 100$$
$$= -2\%$$

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

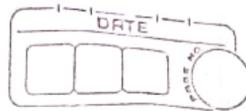
$$\text{Initial Salary} = 100$$

$$\begin{aligned}\text{New salary} &= 100 + \frac{20}{100} \times 100 \\ &= 100 + 20 \\ &= 120\end{aligned}$$

$$\begin{aligned}\text{Final salary} &= 120 + \frac{10}{100} \times 120 \\ &= 120 - 12 \\ &= 108\end{aligned}$$

$$\begin{aligned}\text{Net change} &= \left( \frac{\text{Final salary} - \text{Initial salary}}{\text{Initial salary}} \right) \times 100 \\ &= \frac{108 - 100}{120} \times 100 \\ &= \frac{8}{120} \times 100 \\ &= 0.08 \times 100 \\ &= 8\%\end{aligned}$$

$$\boxed{\text{Net change} = 8\%}$$



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



Profit of 25%.

$$\text{Selling Price} = \text{CP} + \text{Profit}$$

Profit = 25% of CP

$$= \frac{25}{100} \times \text{CP}$$

$$= 0.25 \times \text{CP}$$

Calculate the SP =

$$SP = \text{CP} + 0.25 \times \text{CP}$$

$$SP = (1 + 0.25) \times \text{CP}$$

$$SP = 1.25 \times \text{CP}$$

$$SP = 1.25 \times 100\%$$

$$= 125\% \text{ of CP}$$

$$CP = 100\%$$

- (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?



$$\text{Marked Price (MP)} = ₹500$$

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

$$\text{Profit} = 8\%$$

Calculate the selling price (SP)

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

$$= 500 - (10\% \text{ of } 500)$$



$$SP = 500 - \left( \frac{10}{100} \times 500 \right)$$

$$= 500 - 50$$

$$\boxed{SP = 450}$$

profit formula to find cost price (CP)

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

$$CP = 450$$

$$1 + \frac{8}{100}$$

$$CP = \frac{450}{1.08}$$

$$\boxed{CP = 416.67}$$

Closet value is 420

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



Profit is 20% of the cost price (CP)

Profit percentage on the selling price (SP)

Profit formula is  $SP - CP$

$$\text{Profit} = 0.20 \times CP$$

$$\text{Selling Price} = CP + \text{Profit}$$

$$SP = CP + 0.20 \times CP$$

$$SP = 1.20 \times CP$$

$$\frac{= 0.20}{1.20} \times 100$$

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

$$= 20$$

$$\boxed{SP = 16.67\%}$$

(Ans = first option)

- (24) A product is marked at ₹ 1200 and sold for ₹ 960. What is the percentage discount given?



$$\text{Marked price (MP)} = 1200$$

$$\text{Selling price (SP)} = 960$$

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

$$= 120 - 960 = 240$$

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

$$= 0.20 \times 100$$

$$= 20\%$$

∴ Percentage discount = 20%.

- (25) If an article is bought for ₹ 500 and sold for ₹ 650. What is the percentage profit?



$$\text{Cost price} = 500$$

$$\text{Selling price} = 650$$

$$\text{Profit} = SP - CP = 650 - 500 = 150$$

$$\frac{150}{500} = 0.30$$

$$= 0.30 \times 100 \\ = 30\%$$

Percentage Profit = 30%.

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



A's income is 20% more than B's income

Assume,

$$B's \text{ income} = 100$$

A's income = B's income + 20% of B's income.

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

$$= 100 + 20$$

$$= 120$$

Difference = A's income - B's income

$$= 120 - 100$$

$$= 20$$

$$\text{percentage decrease} = \frac{\text{Difference}}{A's \text{ income}} \times 100$$

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

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

Percentage Decrease = 16.67%

- (27) If the ratio of boys to girls in a school is 3:2, what percentage of the total students are boys?

→

$$\begin{aligned}\text{Total Students} &= 3x + 2x \\ &= 5x\end{aligned}$$

Find Percentage of Boys:

$$\frac{\text{Number of Boys}}{\text{Total Students}} \times 100$$

$$= \frac{3x}{5x} \times 100$$

$$= \frac{3}{5} \times 100$$

$$\boxed{\text{Total Students of Boys} = 60\%}$$

- (28) A City's population increased from 2,00,000 to 2,50,000 in 2 years. What is the percentage increase?

→

$$\text{Initial Population} = 2,00,000$$

$$\text{Final Population} = 2,50,000$$

$$\text{Time} = 2 \text{ years.}$$

Calculate Increase in population.

$$\begin{aligned}\text{Increase} &= \text{Final Population} - \text{Initial Population} \\ &= 250,000 - 200,000 \\ &= 50,000\end{aligned}$$

Find the Percentage Increase:

$$\text{Percentage Increase} = \frac{\text{Increase}}{\text{Initial Population}} \times 100$$

$$\frac{50000}{200000} \times 100$$

$$\frac{50000}{200000} \times 100$$

$$= 0.25$$

$$= 0.25 \times 100$$

$$= 25\%$$

Population increased by 25%.

In an election, a candidate gets 65% of the total votes and wins by 3000 votes. How many total votes were cast?

Winning candidate gets 65% total votes.

Candidate wins by 3000 votes

Total votes be  $x$ .

$$100x - 65x = 35x$$

Votes of winning candidate -

Votes of losing candidate

$$= 3000$$

65% of  $x - 35\% \text{ of } x = 3000$

$$\left( \frac{65x}{100} - \frac{35x}{100} \right) = 3000$$

$$\frac{30x}{100} = 3000$$

$$X = 3000 \times 100$$

30

$$= \frac{300000}{30}$$

30

$$X = 10000$$

$$\boxed{\text{Total votes} = 10000}$$

- (30) The price of an article is reduced by 30%. By what percentage must the new price be increased to restore the original price?



Price of an article is reduced by 30%.

Original price = 100 (Assume)

$$\text{New price} = 100 - \left( \frac{30}{100} \times 100 \right)$$

$$= 100 - 30$$

$$= 70$$

$$\text{Increase} = 100 - 70$$

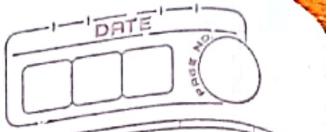
$$= 30$$

$$\text{Percentage Increase} = \frac{\text{Increase}}{\text{New Price}} \times 100$$

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

$$= 300\%$$

$$\boxed{\text{Restore original price is } 42.85\%}$$



(31)

IF a number is increased by 50% and then decreased by 50%, what is the net percentage change?



Original number = 100

Increase by 50%.

$$\text{New value} = 100 + \left( \frac{50}{100} \times 100 \right) \\ = 100 + 50 \\ = 150$$

Decrease by 50%.

$$\text{Final value} = 150 - \left( \frac{50}{100} \times 150 \right) \\ = 150 - 75 \\ = 75$$

$$\text{Net Percentage Change} = 100 - 75 \\ = 25\%$$

$$\text{percentage decrease is} = \frac{25}{100} \times 100 \\ = 25\%$$

∴ Net percentage change is = 25%.

(32)

IF A is 20% taller than B, then B is shorter than A by:



A is 20% taller than B

B's height = 100



A is 20% taller than B

$$\begin{aligned} \text{A's height} &= \text{B's height} + 20\% \text{ of B's height} \\ &= 100 + \frac{20}{100} \times 100 \\ &= 100 + 20 \\ \therefore \text{A's height} &= 120 \end{aligned}$$

Height Between A & B is.

$$\begin{aligned} \text{Difference} &= \text{A's height} - \text{B's height} \\ &= 120 - 100 \\ &= 20 \end{aligned}$$

$$\begin{aligned} \text{Percentage decrease} &= \frac{\text{Difference}}{\text{A's Height}} \times 100 \\ &= \frac{20}{120} \times 100 \\ &= \frac{2000}{120} \\ &= 16.67\% \end{aligned}$$

∴ B is 16.67% shorter than A

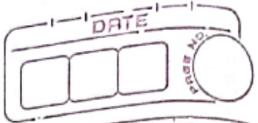
- (33) IF 30% of a number is 90, what is 60% of the same number?  
→

$$30\% \text{ of number} = 90$$

Find 60% of same number

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

$$0.3x = 90$$



$$x = 90$$

0.3

$$x = 300$$

Find 60% of x

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

$$0.6 \times 300 = 180$$

∴ 60% of the number is 180

54)

A person spends 75% of his income and saves ₹ 5000. What is his total income?



Spend 75% of his income.

Saves ₹ 5000

Total income = ?

$$100 - 75 = 25 \text{ (remaining)}$$

$$\frac{25}{100} \times x = 5000$$

$$0.25x = 5000$$

$$x = 5000$$

0.25

$$x = 5000 \times 4$$

$$x = 20000$$

∴ his total income is ₹ 20000





(35)

The price of petrol increases by 20%. By what percentage should consumption be reduced to maintain the same expenses?



Price of petrol increase by 20%.

Initial price of Petrol = 100 per liter

Initial consumption = 100 liters.

Total expense =  $100 \times 100 = 10000$

20% increase in price.

$$\text{New price} = 100 + \frac{20}{100} \times 100$$

$$= 120$$

New consumption be x.

Total expense remains 10000/-

(∴ New price  $\times$  New Consumption, = Old Expense.)

$$120 \times x = 10000$$

$$x = \frac{10000}{120}$$

$$x = 83.33 \text{ liters}$$

Percentage Reduction:

$$100 - 83.33 = 16.67$$

$$\frac{16.67}{100} \times 100$$

$$= 16.67\%$$

∴ Consumption must be reduced by 16.67% to maintain the same expense.





36

The price of a TV was first increased by 20% and then decreased by 10%. What is the overall percentage change?



The price of a TV is first increased by 20%.  
Then it is decreased by 10%.

Initial price = 100

Increase by 20%.

$$\text{New price} = 100 + \left( \frac{20 \times 100}{100} \right)$$

$$= 100 + 20$$

$$= 120$$

Decrease by 10%.

$$\text{Final price} = 120 - \left( \frac{10}{100} \cdot 120 \right)$$

$$= 120 - 12$$

$$= 108.$$

∴ Percentage change = Final price - Initial price

$$= 108 - 100$$

$$= 8$$

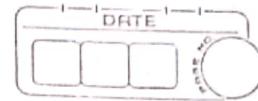
Higher than initial price is

$$\frac{8}{100} \times 100$$

$$= 8\%$$

∴ Overall percentage change is an 8% increase





XAM

37

A shopkeeper marks an item 25% above the cost price and gives a 20% discount. What is his profit/loss percentage?



$$\text{cost price} = 25\%$$

$$\text{marked price discount} = 20\%$$

$$\text{cost price} = 100 \text{ (assumed)}$$

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

$$= 100 + 25$$

$$= 125$$

$$\text{selling price} = \text{MP} - \left( \frac{20}{100} \times \text{MP} \right)$$

$$= 125 - \left( \frac{20}{100} \times 125 \right)$$

$$= 125 - 25$$

$$= 100$$

$$\text{profit/loss} = \text{SP} - \text{CP}$$

$$= 100 - 100$$

$$= 0$$

∴ shopkeeper neither gains nor loses money

38

If the cost price of an article is ₹500 and it is sold at a loss of 20%, what is the selling price?



$$\text{cost price} = 500$$

$$\text{loss percentage} = 20\%$$





∴ Loss formula =

$$SP = 500 - \left( \frac{20}{100} \times 500 \right)$$

$$= 500 - (100)$$

$$= 400$$

∴ selling price is 400

- (39) If a salary is increased by 10% and then decreased by 10%. what is the final percentage change?

→

A salary is first increased by 10%.  
decreased by 10%.

Initial salary = 100

$$\begin{aligned} \text{New salary} &= 100 + \left( \frac{10}{100} \times 100 \right) \\ &= 100 + 10 \\ &= 110 \end{aligned}$$

Decrease by 10%.

$$\begin{aligned} \text{Final salary} &= 110 - \left( \frac{10}{100} \times 100 \right) \\ &= 110 - 11 \\ &= 99 \end{aligned}$$

Overall Percentage change = Final salary - ~~Initial salary~~  
Initial

$$= 99 - 100$$

$$= -1$$

$$\frac{1}{100} \times 100 = 1\% \text{ decrease}$$

∴ final percentage change is 1% decrease

40 A student needs 40% marks to pass. He gets 200 marks and fails by 20 marks. What are the total marks?



Student needs 40% marks to pass

He gets 200 marks but fails by 20 marks.

$$\text{Passing marks} = 200 + 20 = 220$$

40% of total marks = 220

$$\frac{40}{100} \times \text{total marks} = 220$$

$$0.4 \times \text{total marks} = 220$$

$$\text{Total marks} = \underline{220}$$

$$= \underline{0.4}$$
  
$$= 550$$

∴ Total marks are = 550

41 A man spends 20% of his salary on rent, 30% on food and 10% on transport. If he saves ₹ 18000 what is his salary?



20% of salary is spent on rent

30% of salary is spent on food

10% of salary is spent on transport

The remaining amount (savings) = 18000

Total Percent spent = 20% + 30% + 10%

$$= 60\%$$

40% of salary = 18000

$$\frac{40}{100} \times \text{salary} = 18000$$

$$0.4 \times \text{Salary} = 18000$$

$$\text{Salary} = \frac{18000}{0.4}$$

$$= 45000$$

∴ man's salary is 45000

- (42) The cost of an item is first increased by 30%, and then decreased by 30%, what is the overall percentage change?

The cost of an item is first increased by 30%,  
decrease by 30%.

$$\text{Initial cost price} = 100$$

Increase by 30%.

$$\text{New price} = 100 + \left( \frac{30}{100} \times 100 \right)$$

$$= 100 + 30$$

$$= 130$$

Decrease by 30%.

$$\text{Final price} = 130 - \left( \frac{30}{100} \times 130 \right)$$

$$= 130 - 39$$

$$= 91$$

Overall Percentage Change = Final Price - Initial Price

$$= 91 - 100 = -9$$

Decreased Percentage =  $\frac{9}{100} \times 100 = 9\%$  decrease

∴ Overall percentage change is = 9%, decrease

(43)

The population of a town increase by 10% every year. If the current population is 10000, what will it be after 3 years?



Current population = 10,000

Annual increase = 10%

Time = 3 years.

Population growth formula :

$$P = P_0 \times \left(1 + \frac{r}{100}\right)^t$$

$P_0 = 10000$  (initial population)

$r = 10\%$  (growth rate)

$t = 3$  years.

$$P = 10000 \times \left(1 + \frac{10}{100}\right)^3$$

$$P = 10000 \times (1.1)^3$$

calculate the growth:

$$(1.1)^3 = 1.1 \times 1.1 \times 1.1 = 1.331$$

$$P = 10000 \times 1.331$$

$$= 13310$$

∴ The population after 3 years = 13310

(44)

If 15% of A is equal to 20% of B then A:B is.



15% of A = 20% of B

ratio = A:B

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

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

$$15A = 20B$$

Solve A:B.

Both sides by 5 divided.

$$3A = 4B$$

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

$$A:B = 4:3$$

∴ The Ratio A:B is 4:3

- (45) If the cost price of an item is ₹ 800 and the profit is 25%. what is the selling price.



$$\text{Cost price} = 800$$

$$\text{Profit Percentage} = 25\%$$

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

$$= \frac{25}{100} \times 800 = 200$$

$$= 800 + 200$$

$$= 1000$$

∴ The selling price is ₹ 1000

16

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

$$\text{Cost price (CP)} = 200$$

$$\text{Selling price} = 250$$

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

$$= 250 - 200$$

$$= 50$$

$$\text{Profit percentage formula} = \frac{(50 \times 100)}{200}$$

$$= \frac{5000}{200}$$

∴ The profit percentage is = 25%.

17

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

$$\text{Selling price} = 720$$

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

$$\text{Cost price formula} = \frac{720 \times 100}{100 + 20}$$

$$= \frac{720 \times 100}{120}$$

$$= \frac{72000}{120}$$

$$= 600$$

∴ The cost price is 600.

- (48) A shopkeeper sells an item at a loss of 15%. If the cost price is ₹ 500, find the selling price.



$$\text{Cost price} = 500$$

$$\text{Loss percentage} = 15\%$$

$$\text{Selling price} = \frac{500 \times (100 - 15)}{100}$$

$$= \frac{500 \times 85}{100}$$

Calculate the selling price.

$$= \frac{42500}{100}$$

$$= 425$$

∴ The selling price is 425.

- (49) A man purchased a cycle for ₹ 1500 and sold it at a loss of 10%. What was the selling price?



$$\text{Cost price} = 1500$$

$$\text{Loss percentage} = 10\%$$

$$\text{Selling price} = \frac{1500 \times (100 - 10)}{100}$$

$$= \frac{1500 \times 90}{100}$$

$$= \frac{135000}{100}$$

$$= 1350$$

∴ The selling price is 1350.

(50) A trader marks his goods at 30% above the cost price and allows a discount of 10%. What is his gain percent?



Mark-up = 30%.

Discount = 10%.

$$MP = CP + \left( \frac{30}{100} \times CP \right)$$

$$= CP \times 1.3$$

$$\text{Selling price} = MP - \left( \frac{10}{100} \times MP \right)$$

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

$$= MP \times 0.90$$

$$MP = CP \times 1.3$$

$$SP = (CP \times 1.3) \times 0.90$$

$$SP = CP \times 1.17$$

$$\left( \frac{1.17CP - CP}{CP} \right) \times 100$$

$$\left( \frac{0.17CP}{CP} \right) \times 100$$

$$= 17\%$$

∴ The gain percentage is  $\underline{\underline{= 17\%}}$ .