$\frac{1}{2} = \frac{50}{100}$

PERCENTAGE

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CONCEPT - PERCENTAGE

$50 \longrightarrow 60$

$\frac{10}{50} \times 100$

$= +20\%$

$50 \longrightarrow 40$

$\frac{10}{50} \times 100$

$= -20\%$

$$\text{Change \%} = \frac{\text{NV} - \text{OV}}{\text{OV}} \times 100$$

$$= \frac{\text{Change}}{\text{Old Value}} \times 100$$

1. The population of a town, named Mirzapur, is 8000. It decreases annually at the rate of 20% p. a. What will be its population after 2 years?

A) 1600 B) 4800 C) 6400 D) 5120

8000

↓ -20% = 1600

6400

↓ -20% = 1280

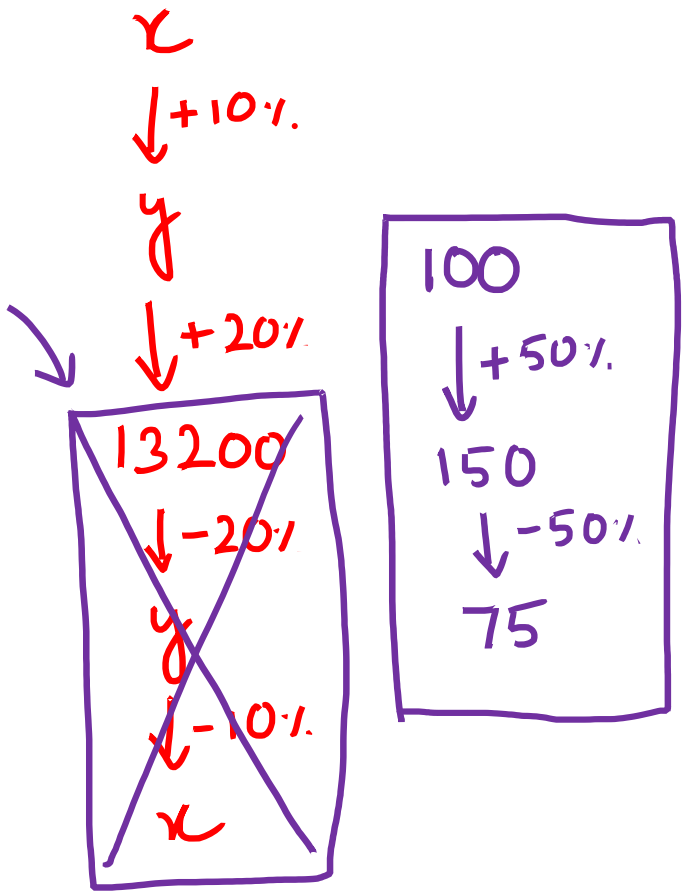
5120

$8000 \times \frac{80}{100} \times \frac{80}{100}$

$= 5120$

2. The population of a town, named Winterfell, increases 10% and 20% respectively in two consecutive years. The present population of the town is 13200. Then what was the population of the town 2 years ago?

A) 9504 B) 10001 C) 10000 D) 10100



$$x \times \frac{110}{100} \times \frac{120}{100} = 13200$$

$$x = \frac{13200 \times 100 \times 100}{110 \times 120}$$

$$= 10000$$

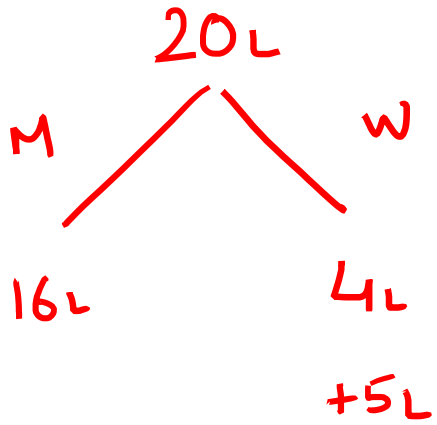
$$A + B + \frac{AB}{100}$$

$$10 + 20 + \frac{200}{100}$$

$$= 32\%$$

3. A mixture of 20 litres of milk and water contains 20% of water. A new mixture is formed by adding 5 litres of water. What is the percentage of milk in the new mixture?

A) 36% B) 20% ✓C) 64% D) 46%



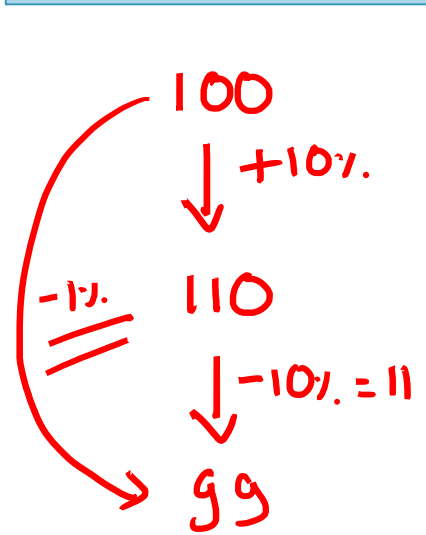
% of Milk in new mix

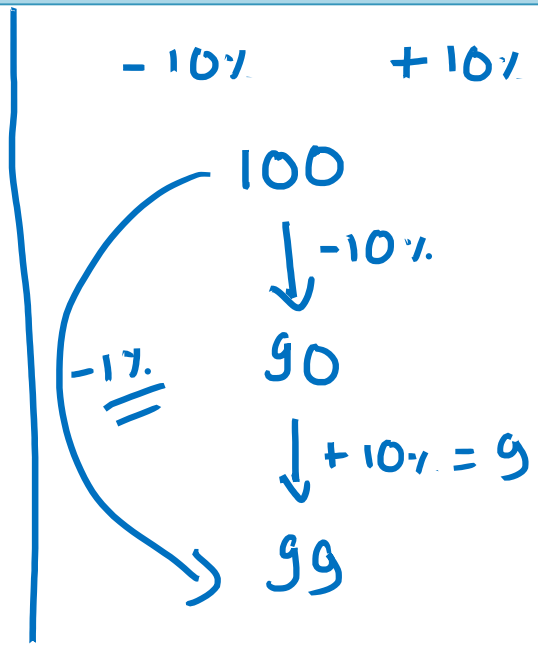
$= \frac{16}{25} \times 100$

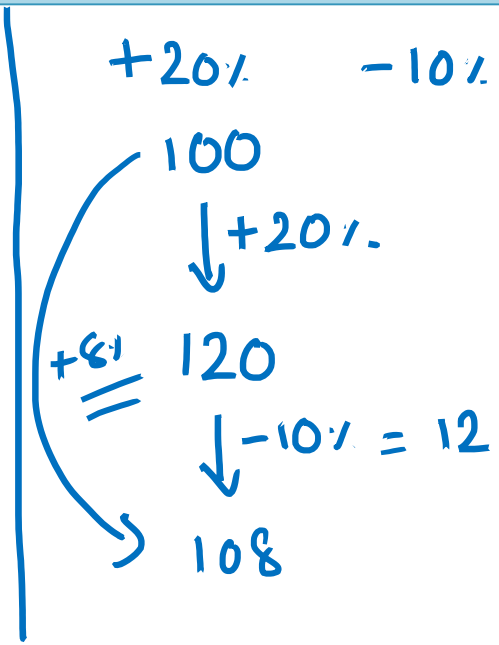
$= 64\%$

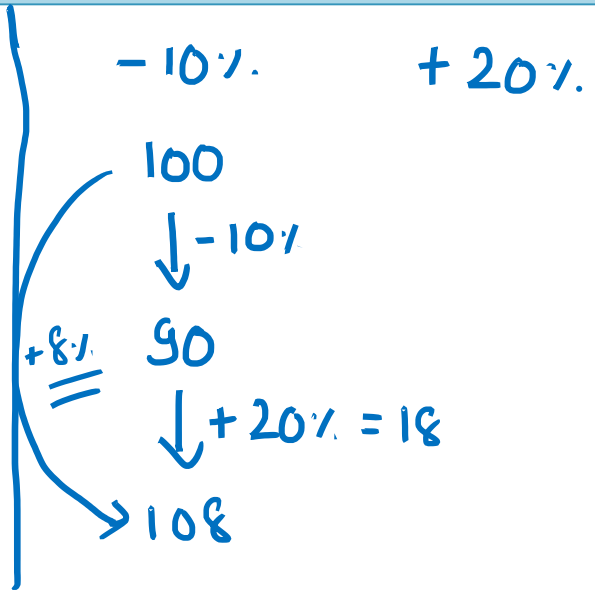
4. When a number is first increased by 10% and then reduced by 10%, the number:

A) Does not change ✓B) Decreases by 1% C) Increases by 1% D) None of these









5. In an election between two candidates, 20% of votes were declared invalid. First candidate got 70% of the valid votes and a lead of 1600 votes. The total number of votes enrolled in that election was:

A) 5000 votes B) 5400 votes C) 10000 votes D) 6667 votes

100

↓ − 20% INVALID

80 Valid

win 70% lose 30%

56 − 24 = 32 = Lead

Lead Total

32 100

1600 x

$$x = \frac{100 \times 1600}{32} = 5000$$

6. If the price of petrol increases by 25%, by how much must Batman cut down his consumption so that his expenditure on petrol remains constant?

A) 25% B) 16.67% C) 20% D) 33.33%

Old $P = 100$ $C = 100$ $E = 100 \times 100 = 10000$

New $P = 125$ $C = x$ $E = 10000$

-20%

$125x = 10000$

$x = \frac{10000}{125} = 80$

$P = 100$ $E = 100$

$P_2 = 125$ $E_2 = 100$

$\frac{125 - 100}{125} \times 100$

$= \frac{25}{125} \times 100 = 20\%$

7. If the price of petrol increases by 50% and Stark intends to spend only an additional 25% on petrol, by how much will he reduce the quantity of petrol purchased?

A) 25% B) 16.66% C) 50% D) 20%

$P = 100$ $E = 100$

$P_2 = 150$ $E_2 = 125$

$$\frac{150-125}{150} \times 100 = \frac{25}{150} \times 100 = 16.66\%$$

$P = 100$ $C = 100$ $E = 100 \times 100 = 10000$

$P_2 = 150$ $C_2 = x$ $E_2 = 100 \times 100 \times \frac{125}{100} = 12500$

-16.66%

$150x = 12500$

$x = \frac{12500}{150} = 83.33$

8. If X and Y are 20% and 25% greater than Z respectively, by how much percentage is X smaller than Y?

A) 20% ✓B) 4% C) 5% D) 4.16%

$Z = 100$

$X = 120$

$Y = 125$

$$\frac{125-120}{125} \times 100$$

$$= \frac{5}{125} \times 100$$

$$= 4\%$$

9. In XYZ College, 65% of students are less than 20 years of age. The number of students more than 20 years of age is 2/3rd of number of students of 20 years of age, which is 42. What is the total number of students in the college?

A) 75 B) 90 C) 130 D) 200 ✓

$N_{<20}$ = 65% of Total

N_{20} + $N_{>20}$ = 35% of Total

$N_{20} = 42$

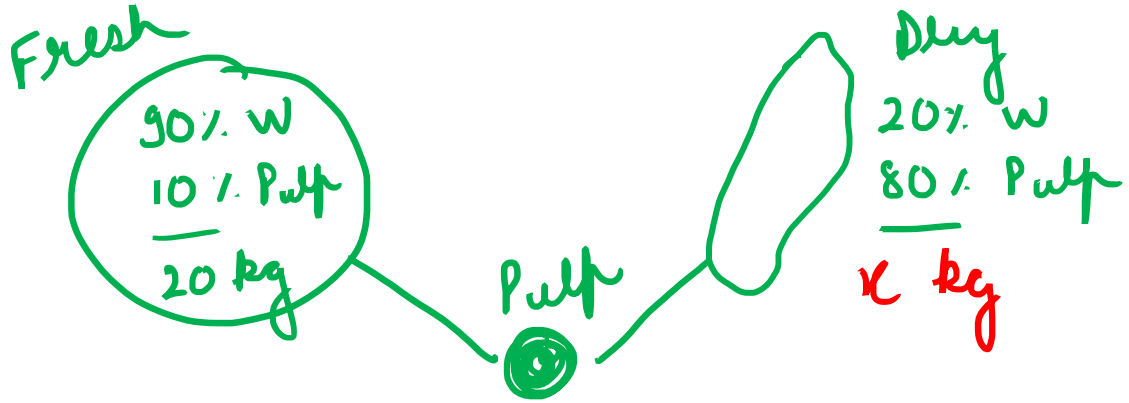
$N_{>20} = \frac{2}{3} \times 42 = 28$

$42 + 28 = \frac{35}{100} \times T$

$70 \times \frac{100}{35} = T = 200$

10. Fresh grapes contain 90% water by weight while dried grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes?

A) 2 kg B) 2.4 kg C) 2.5 kg D) None of these



2 kg Pulp

20% W

20% of 2 = 0.4

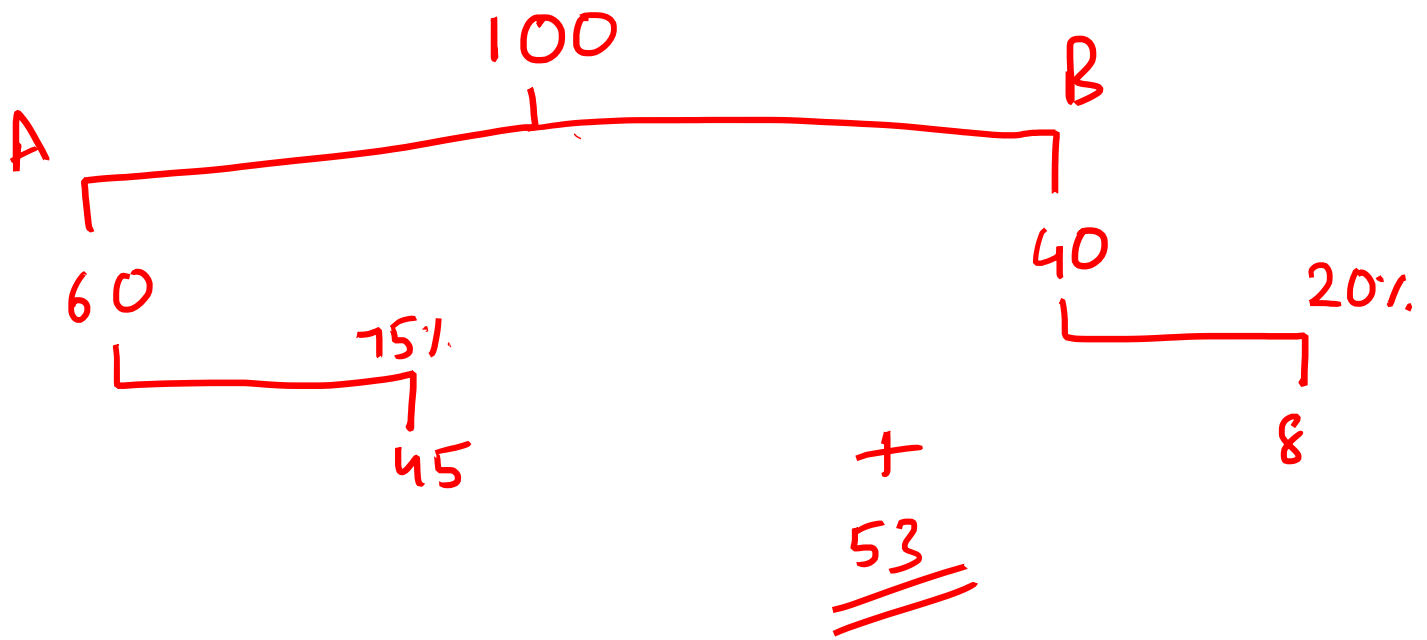
Pulp Fresh Grapes = Pulp Dry Grapes

10% of 20 kg = 80% of x kg

$x = \frac{20}{8} = 2.5$ kg

11. In a certain city, 60 percent of the registered voters are Party A supporters and the rest are Party B supporters. In an assembly election, if 75% of the registered Party A supporters and 20% of the registered Party B supporters are expected to vote for Candidate A, what percent of the registered voters are expected to vote for Candidate A?

A. 20 B. 60 C. 75 ✓D. 53



12. Hulk mistakenly divided a number by 2 instead of multiplying it by 2. Find the percentage of error.

A) 35% B) 45% C) 65% ✓ D) 75%

$$Ch\% = \frac{\text{Change}}{\text{Old Value}} \times 100$$

$$Error\% = \frac{\text{Error}}{\text{Correct Value}} \times 100$$

$N = 100$

$W = \frac{100}{2} = 50$

$C = 100 \times 2 = 200$

$Err\% = \frac{150}{200} \times 100$

$= 75\%$

PROFIT & LOSS

CONCEPT – PROFIT & LOSS

$CP \xrightarrow{+20\%} SP$ $\quad$ $CP \xrightarrow{-20\%} SP$

G → SP↑ CP↓

L → SP↓ CP↑

$CP \xrightarrow{G/L} SP$

$Ch\% = \frac{Change}{Old} \times 100$

$GL\% = \frac{Diff}{CP} \times 100$

G, CP	G, SP
SP = +	CP = −
L, CP	L, SP
SP = −	CP = +

G = 20%

$SP = \frac{120}{100} \times CP$

$CP = \frac{100}{120} \times SP$

L = 20%

$SP = \frac{80}{100} \times CP$

$CP = \frac{100}{80} \times SP$

13. Alfred buys an old scooter for Rs.4700 and spends Rs.800 on its repairs. If he sells the scooter for Rs.5800, his gain percent is:

A) $4\ ^{4}/_{7}\%$ ✓ B) $5\ ^{5}/_{11}\%$ C) 10% D) 12%

CP = 4700 + 800 = 5500

SP = 5800

$G\% = \frac{300}{5500} \times \frac{100^{20}}{1} = \frac{60}{11} = 5\frac{5}{11}\%$

14. If loss is 1/3rd of SP, the loss percentage is _____?

A) 16% B) 25% C) 30% D) 33.33%

$SP = 100$

$L = \frac{100}{3}$

$CP = 100 + \frac{100}{3} = \frac{400}{3}$

$L\% = \frac{100/3}{400/3} \times 100 = 25\%$

15. A shopkeeper marks all his goods at 50% above the cost price and offers a discount of 25% on the marked price. What is his actual profit?

A) 27% B) 12.50% C) 20% D) 15%

CP = 100

MP = 150

Dis = 25% of 150 = 37.5

SP = 150 − 37.5 = 112.5

$$G\% = \frac{112.5 - 100}{100} \times 100 = 12.5\%$$

16. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

A) 30% B) 70% C) 100% D) 236%

$CP = 100$

$G_1 = 320$

$SP = 100 + 320 = 420$

$CP_2 = 125$

$G_2 = 420 - 125 = 295$

$G_1\%\ w.r.t\ SP = \frac{295}{420} \times 100$

$\simeq \frac{300}{400} \times 100 = 75\%$

Ans = 70%

17. An object is sold for Rs.150 making a profit of 50% on the selling price. If the article is bought for Rs.25 less, what price must be marked so as to gain 40% by selling the object at marked price?

A) 90 B) 80 C) 50 D) 70

$SP = 150$

$G_1 = 50\%$ of 150

$= 75$

$CP = 150 - 75 = 75$

$CP_2 = 75 - 25 = 50$

$G_2 = 40\%$

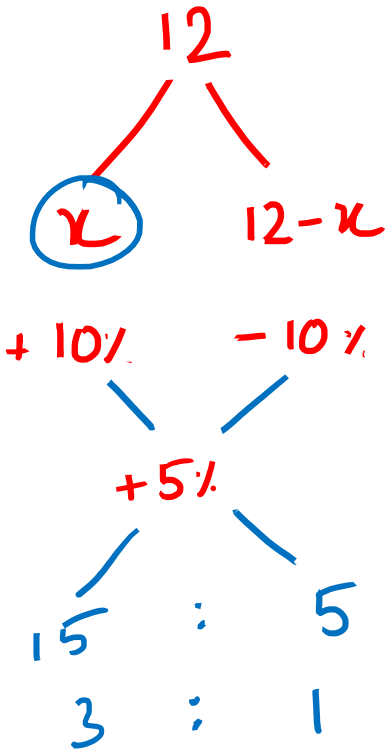
$SP_2 = \frac{140}{100} \times 50 = 70$

$G_2 = 40\%$ of $50 = 20$

$SP_2 = 50 + 20 = 70$

18. Joey has 12 eggs with him. He sells x at a profit of 10% and remaining at a loss of 10%. He gains 5% on the whole. What is the value of x?

A) 7 B) 9 C) 8 D) 10



$$x \times \frac{110}{100} + (12-x) \times \frac{90}{100} = 12 \times \frac{105}{100}$$

$$110x + 12 \times 90 - 90x = 12 \times 105$$

$$20x = 12(105 - 90)$$

$$x = \frac{12 \times 15}{20} = 9$$

19. Some articles were bought at 6 articles for Rs.5 and sold at 5 articles for Rs.6. Gain percent is:

A) 30% B) $33\frac{1}{3}\%$ C) 35% D) 44%

CP of 6 art = 5

SP of 5 art = 6

CP of 1 art = $\frac{5}{6}$

SP of 1 art = $\frac{6}{5}$

$$G\% = \frac{\frac{6}{5} - \frac{5}{6}}{\frac{5}{6}} \times 100 = \frac{\frac{36 - 25}{30}}{\frac{5}{6}} \times 100 = \frac{11}{30} \times \frac{6}{5} \times 100$$

$$= 44\%$$

20. The cost price of 20 articles is the same as the selling price of *x* articles. If the profit is 25%, then *x* is:

A) 15 B) 16 C) 18 D) 25

CP of 20 art = SP of x art = P

CP of 1 art = $\frac{P}{20}$

SP of 1 art = $\frac{P}{x}$

Gain = 25%

$SP = \frac{125}{100} \times CP$

$\frac{P}{x} = \frac{125}{100} \times \frac{P}{20}$

$x = \frac{100 \times 20}{125} = 16$

EXTRA QUESTIONS:

21. In an election between two candidates, 10% of votes were declared invalid. First candidate got 60% of the valid votes and a lead of 1800 votes. The total number of votes enrolled in that election was:

A) 3000 votes B) 5400 votes C) 10000 votes D) 6667 votes

22. By selling 33 meters of cloth, one gains the selling price of 11 meters. Find the gain percent.

A) 50% B) 60% C) 75% D) 66%

23. The difference between a discount of 35% and 2 successive discounts of 20% on a certain bill was Rs.22. Find the amount of the bill.

A) Rs.1000 B) Rs.440 C) Rs.1100 D) Rs.2200

24. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?

A) 3 B) 4 C) 5 D) 6

25. Scrooge purchases 50 dozen eggs at Rs. 4 per dozen. Of these, 40 eggs were found broken. At what price should he sell the remaining eggs in order to make a profit of 5% on the whole?

A) Rs.5/dozen B) Rs.4.5/dozen C) Rs.6/dozen D) Rs.4.25/dozen

ANSWER KEY – PERCENTAGE, PROFIT & LOSS

QUESTION	ANSWER	QUESTION	ANSWER	QUESTION	ANSWER
1	D	11	D	21	C
2	C	12	D	22	A
3	C	13	B	23	D
4	B	14	B	24	C
5	A	15	B	25	B
6	C	16	B		
7	B	17	D		
8	B	18	B		
9	D	19	D		
10	C	20	B		