

41. Nand Kishore gives 35% of the money he had to his wife and gave 50% of the money he had to his sons. Remaining amount of ₹ 11,250 he kept for himself. What was the total amount of money Nand Kishore had?
 (1) ₹ 63,750 (2) ₹ 75,000
 (3) ₹ 73,650 (4) ₹ 72,450
 (5) None of these
42. If the radius of a right circular cylinder is decreased by 50% and its height is increased by 60%, its volume will be decreased by
 (1) 10% (2) 60%
 (3) 40% (4) 20%
 (5) None of these
43. In examination, 65% of the students passed in Mathematics, 48% passed in Physics and 30% passed in both. How much percent of students failed in both the subjects?
 (1) 17% (2) 43%
 (3) 13% (4) 47%
 (5) None of these
44. In a village, each of the 60% of families has a cow; each of the 30% of families has buffalow and each of the 15% of families has both a cow and a buffalow. In all there are 96 families in the village. How many families do not have a cow or a buffalow?
 (1) 20 (2) 24
 (3) 26 (4) 28
 (5) 32
45. p is six times as large as q. By how much percent is q less than p?
 (1) $83\frac{1}{3}$ (2) 70
 (3) $63\frac{1}{3}$ (4) 50
 (5) None of these
46. The price of sugar is increased by 20%. As a result, a family has decreased its consumption by 20%. The expenditure of the family on sugar is decreased by
 (1) 0% (2) 2.5%
 (3) 4% (4) 5%
 (5) None of these
47. If the income tax is increased by 19% the net income is reduced by 1%. The rate of income tax is
 (1) 6% (2) 4%
 (3) 5% (4) 7.2%
 (5) None of these
48. The population of a village was 9600. In a year, with the increase in population of males by 8% and that of females by 5%, the population of the village became 10272. What was the number of males in the village before increase?
 (1) 4200 (2) 4410
 (3) 6400 (4) 6048
 (5) None of these
49. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?
 (1) 44% (2) 34%
 (3) 54% (4) 64%
 (5) 74%
50. If 60% of the students in a school are boys and the number of girls is 972, how many boys are there in the school?
 (1) 1258 (2) 1458
 (3) 1324 (4) 1624
 (5) 1828

PERCENTAGE - FRACTION CHART

| | | | |
|---------------------------------|----------------------------------|----------------------------------|---|
| $\frac{1}{2} = 50\%$ | $\frac{1}{8} = 12\frac{1}{2}\%$ | $\frac{1}{20} = 5\%$ | $\frac{2}{11} = 18\frac{2}{11}\%$ |
| $\frac{1}{3} = 33\frac{1}{3}\%$ | $\frac{1}{9} = 11\frac{1}{9}\%$ | $\frac{1}{25} = 4\%$ | $\frac{5}{11} = 45\frac{5}{11}\%$ |
| $\frac{1}{4} = 25\%$ | $\frac{1}{10} = 10\%$ | $\frac{2}{5} = 40\%$ | $\frac{1}{8} = 12\frac{1}{2}\%$ |
| $\frac{1}{5} = 20\%$ | $\frac{1}{11} = 9\frac{1}{11}\%$ | $\frac{3}{5} = 60\%$ | $\frac{3}{8} = 36 + 1\frac{1}{2}\% = 37\frac{1}{2}\%$ |
| $\frac{1}{6} = 16\frac{2}{3}\%$ | $\frac{1}{12} = 8\frac{1}{3}\%$ | $\frac{4}{5} = 80\%$ | $\frac{5}{8} = 62\frac{1}{2}\%$ |
| $\frac{1}{7} = 14\frac{2}{7}\%$ | $\frac{1}{15} = 6\frac{2}{3}\%$ | $\frac{4}{7} = 57\frac{1}{7}\%$ | $\frac{7}{8} = 87\frac{1}{2}\%$ |
| | | $\frac{1}{11} = 9\frac{1}{11}\%$ | |

Answers with explanations

1.1; 50% of $(x - y) = 30\% \text{ of } (x + y)$
 $5(x - y) = 3(x + y)$
 $5x - 5y = 3x + 3y$
 $2x = 8y$

$$\frac{x}{y} = \frac{8}{2} \Rightarrow y = \frac{2}{8} \times 100 = 25\% \text{ of } x$$

2.3; Paramount Concept:-

Total income will be 7800
 10% of A = 15% of B = 20% of C
 If 5% = 1

then, $2A = 3B = 4C$

$$\text{L.C.M.} = 12$$

$$A : B : C$$

$$\frac{12}{2} : \frac{12}{3} : \frac{12}{4}$$

$$A : B : C = 6 : 4 : 3 = \text{Total} = 13$$

$$\text{B's income} = \frac{4}{13} \times 7800 = ₹ 2400$$

3.1; Short Trick:

$$50\% + 50\% + 50\% \text{ of } 50\% \\ 100\% + 25\% = 125\%$$

3.1; Paramount Concept:-

$$50\% = \frac{1 \rightarrow \text{increment}}{2 \rightarrow \text{all}}$$

This implies that when old radius = 2 units then 50% increment means and an increase of 1 unit

i.e. **old** : **New**
 $2 \rightarrow (2+1) = 3$

New, **old Area** : **New Area**

$$\pi(2)^2 : \pi(3)^2$$

We cancel the constant term in such question
 This means

| old Area | : | New Area |
|-------------|---|----------|
| 4 | : | 9 |
| ◻ | | ◻ |
| diff. = (5) | | |

$$\therefore \text{Req. \%} \frac{\text{diff.}}{\text{original}} \times 100 = \frac{5}{4} \times 100 = 125\%$$

3.1; Paramount Concept:- 2

Let the old area to be 100
50% increase means 150%
So, $100 \times 150\% \times 150\%$ because of 2 dimensional

$$100 \times \frac{3}{2} \times \frac{3}{2} = 225$$

$$\begin{array}{ccc} 100 & \xrightarrow{\quad} & 225 \\ & \text{increase} & = 125\% \end{array}$$

2nd Method:-

$$\text{Let } R_1 = 100$$

$$\text{then } R_2 = 150 \text{ (as increase in 50%)}$$

$$\text{Area of a circle} = \pi r^2$$

$$\% \text{ increase in area} = \frac{\text{diff.}}{\text{original}} \times 100$$

$$\frac{\pi(r_2)^2 - \pi(r_1)^2}{\pi r_1^2} \times 100$$

$$\frac{\pi(r_2^2 - r_1^2)}{\pi r_1^2} \times 100 = \frac{r_2^2 - r_1^2}{r_1^2} \times 100$$

$$\frac{(150)^2 - (100)^2}{(100)^2} \times 100 \left[\begin{array}{l} a^2 - b^2 = (a+b)(a-b) \\ 150^2 - 100^2 = (150+100)(150-100) \\ (150-100) = 250 \times 50 \end{array} \right]$$

$$\frac{250 \times 50}{10000} \times 100 = 25 \times 5 = 125\%$$

4.4; Paramount Concept:-

$$125 \times \frac{11}{10} \times \frac{9}{10} = 123.75$$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ \text{Number} & y (+10\%) & x (-10\%) \end{array}$$

$$4.4; x = y - 10\% \text{ of } y$$

$$x = \frac{9}{10} y$$

$$\text{New, } y = 125 + 10\% \text{ of } 125$$

$$= \frac{110}{100} \times 125$$

$$\therefore x = \frac{9}{10} \times \frac{110}{100} \times 125 = 123.75$$

2nd Method:-

$$y = 125 + \frac{10}{100} \times 125 = 125 + 12.5 \text{ (as } y \text{ is } 10\% \text{ more than } 125)$$

$$x = 137.5 - \frac{10}{100} \times 137.5 \text{ (as } x \text{ is } 10\% \text{ less than } y)$$

$$137.5 - 13.75 = 123.75/-$$

5.2; Short Trick:

$$\begin{aligned} +20\% - 20\% + (+20\%) \text{ of } (-20\%) \\ 0\% - 4\% \\ = -4\% \text{ (decrease)} \end{aligned}$$

5.2; Paramount Concept:-

$$\begin{array}{ccc} \text{Let} & \frac{\text{old}}{100} & \xrightarrow{\quad +20\% \quad} \frac{\text{New}}{120} \\ & & \xrightarrow{-20\%} \end{array}$$

$$\text{Now again } 120 \xrightarrow{\quad} 96$$

$$\begin{aligned} \text{diff.} = 4/- \Rightarrow \% \text{ diff.} &= \frac{\text{diff.}}{\text{original}} \times 100 \\ &= \frac{4}{100} \times 100 = 4\% \text{ dec.} \end{aligned}$$

5.2; Paramount Concept:-2

If increase and decrease is the same percent, then

$$\frac{(\text{Percent})^2}{100} \Rightarrow \frac{20^2}{100} = \frac{400}{100} = 4$$

In this type of question there is always a decrease.

2nd Method:-

Let the salary be x
(case 1 :- when 20% ↑)

$$x \rightarrow \frac{120x}{100}$$

(case 2 :- when 20% ↓)

$$\frac{120x}{100} \rightarrow \frac{80}{100} \times \frac{120x}{100} = \frac{24x}{25}$$

$$\text{Change in salary} = x - \frac{24x}{25} = \frac{x}{25}$$

$$\text{Req. \%} = \frac{\frac{x}{25}}{x} \times 100 = 4\% \text{ (less)}$$

$$6.2; 1 \text{ hour } 45 \text{ minutes} = \frac{7}{4} \text{ hours}$$

$$\frac{7}{4 \times 24} \times 100 = 7.291\%$$

$$7.1; \text{Fail in Maths} = 35\%$$

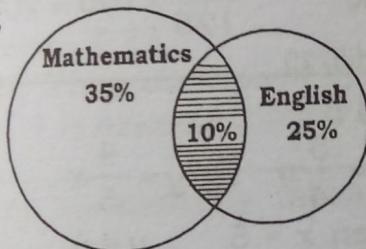
$$\text{Fail in English} = 25\%$$

$$\text{Fail in Both} = 10$$

$$\text{Total fail} = 50\% \text{ (Total pass} = 50\%)$$

2nd Method:-

7.1;



Failed in Either Mathematics or

$$\text{English} = 35 + 25 - 10 = 50\%$$

Clearly from then Venn Diagram
 10% is included in both and has
 been calculated 2 times so we
 simply add both the % and subtract
 the common area.

So, we get the extra % of failed students
 in either of the subject.

$$\text{New, req. \%} = (100 - 50) = 50\%$$

8.2; Short Trick:

- 40% - 40% + (-40%) of (-40%)
- 80% + 16% = 64%

8.2; If the length and breadth of a rectangle are changed by $x\%$ and $y\%$ respectively, the effective change in

$$\text{area} = \left(x + y + \frac{xy}{100} \right)\%$$

$$\text{Here, } x = -40\%, y = -40$$

∴ Percentage decrease

$$= \left(-40 - 40 + \frac{40 \times 40}{100} \right)\% = (-80 + 16)\% \\ = -64\%$$

Negative sign shows decrease.

Paramount Concept:-

$$40\% = \frac{2 \rightarrow \text{decrease}}{5 \rightarrow \text{original side}}$$

Thus,

| | original | : | New |
|--------|-----------------------|---|----------------------|
| Length | 5 | | 3 |
| Breath | $\times \frac{5}{25}$ | | $\times \frac{3}{9}$ |
| Area | | | |

$$\text{Area} = (l \times b)$$

$$\text{Thus, Req. change} = 25 - 9 = 16$$

$$\text{Req. \%} = \frac{16}{25} \times 100 = 64\% \text{ (less)}$$

3rd Method:-

$$l = \frac{\text{old}}{100} \quad \frac{\text{New}}{60}$$

$$b = 100 \quad 60$$

or

$$l = 10 \quad 6$$

$$b = 10 \quad 6$$

$$\text{Area} = 100 \quad 36$$

$$\text{Dec} = 64$$

$$\text{Dec\%} = \frac{\text{dec.}}{\text{original}} \times 100$$

$$= \frac{64}{100} \times 100 = 64\%$$

9.2; $100 \xrightarrow{-25\%} 125\%$

$$\text{To keep expense same} = \frac{25}{125} \times 100 = 20\%$$

Consumption should be decreased by 20%

9.2; Paramount Concept:-

$$25\% = \frac{1 \rightarrow \text{increase}}{4 \rightarrow \text{original}}$$

$$\begin{array}{l} \text{Original Price :} \\ \quad 4 \qquad \qquad \text{New price} \\ \quad : \qquad \qquad 5 \end{array}$$

Now, to maintain the same expense, consumption is to be reduced i.e. $\frac{1}{5} \times 100 = 20\%$

$$\text{Reduction} = \frac{1 \rightarrow \text{reduction}}{5 \rightarrow \text{new price}}$$

2nd Method:-

| Price | Qty. | Exp. (Price \times Qty.) |
|---------------------|---------------------------|----------------------------|
| ₹10 | 10kg | ₹100 (original) |
| $\downarrow + 25\%$ | \downarrow remains same | $\downarrow + ₹25\%$ |
| ₹12.5 | 10kg | ₹125 (new) |

But we have to keep the expense same so ₹25 is to be reduced.

$$\therefore \text{Req. \%} = \frac{₹25}{₹125} \times 100 = 20\%$$

3rd Method:-

$$\text{Price} \times \text{consumption} = \text{Expenditure}$$

$$P_1 \times C_1 = P_2 \times C_2 \quad (\text{as Exp. remains same})$$

$$100 \times C_1 = 125 \times C_2$$

$$\frac{C_1}{C_2} = \frac{125}{100} = \frac{5}{4}$$

$$\text{Dec.} = 1$$

$$\text{Dec. \%} = \frac{\text{Decrease}}{\text{Original}} \times 100 = \frac{1}{5} \times 400 = 20\%$$

10.2; Short Trick:

$$-25\% + 30\% + (-25\%) \text{ of } (30\%)$$

$$5\% - 7.5\% = 2.5\% \text{ decrease}$$

10.2; Let the price of the article be ₹100 and the daily sale be 100 units
 $\therefore \text{Revenue per day} = 100 \times 100 = ₹10000$

Case II:

$$\text{New receipts} = 75 \times 130 = ₹9750$$

$$\text{Decrease} = ₹(10000 - 9750) = ₹250$$

$$\therefore \% \text{ decrease} = \frac{250}{10000} \times 100 = 2\frac{1}{2}\%$$

10.2; Paramount Concept:-

$$\begin{array}{ccc} \text{Price (₹)} & \times \text{Qty. (kg)} & = \text{expenses (₹)} \\ 10 & 10 & = 100 \end{array}$$

$$\begin{array}{ccc} \downarrow (-25\%) & \downarrow (+30\%) & \downarrow (-₹2.5) \\ 7.5 & \times 13 & = 97.5 \end{array}$$

$$\text{Req. \%} = \frac{-2.5}{100} \times 100 = 2\frac{1}{2}\%(\text{less})$$

10.2; Paramount Concept:-2

Let the daily sale is ₹100

$$\text{So, } 100 \times \frac{75}{100} \times \frac{130}{100} = 97.5$$

means:- $100 \Leftrightarrow 97.5$
decreases by 2.5%

11.3; Short Trick:

$$\begin{array}{ccc} x & y & \\ 125 & 100 & \\ \curvearrowright & \curvearrowright & \\ \text{diff. 25} & & \end{array} \quad \frac{25}{125} \times 100 = 20\%$$

2nd Method:-

$$x = \frac{125}{100} y = \frac{5}{4} y \Rightarrow y = \frac{4}{5} x$$

This means when $x = 5$, $y = 4$

$$\therefore \text{Req. \%} = \frac{1}{5} \times 100 = 20\%$$

12.1; Short Trick:

$$+ 20 - 20\% + (20\%) \text{ of } (-20\%)$$

$$= -4\%$$

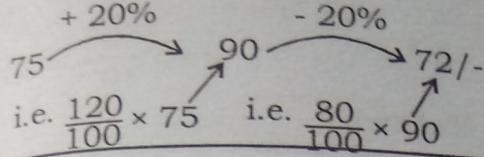
$$\therefore \text{C.P.} = 75 - 4\% \text{ of } 75 = 75 - 3 = ₹72$$

12.1; Paramount Concept:- 1

$$\frac{20^2}{100} \Rightarrow 4\% \text{ less}$$

$$\text{then} \Rightarrow \frac{75 \times 96}{100} = 72$$

Paramount Concept:- 2



12.1; Effective decrease

$$= \left(20 - 20 - \frac{20 \times 20}{100} \right) \% = -4\%$$

Present cost of the article = 96% of ₹ 75

$$= \frac{75 \times 96}{100} = ₹ 72$$

Paramount Concept:- 3

$$20\% (\uparrow) \Rightarrow \frac{1}{5}; \quad 20\% (\downarrow) = \frac{1}{5}$$

Original : New

5 → 6 → When increased by 20%, 5 becomes 6.

$\cancel{5} \rightarrow \cancel{4} \rightarrow$ When decreased by 20%, 5 becomes 4.

$$\begin{array}{r} 25 \\ \underline{\times 3} \qquad \qquad \underline{\times 3} \\ 75 \text{ (given)} \quad ₹ 72 \end{array}$$

(25 When multiplied by 3 gives 75.
Hence 24 is also multiplied by 3)

13.2; Let his monthly income be ₹ x

$$\text{Money spent on house holds} = \frac{x}{2}$$

Money spent out of the remaining

$$\text{amount} = 85\% \text{ of } \frac{x}{2}$$

$$\text{Savings} \Rightarrow 15\% \text{ of } \frac{x}{2} = 900$$

$$\Rightarrow x = \frac{900 \times 2 \times 100}{15}$$

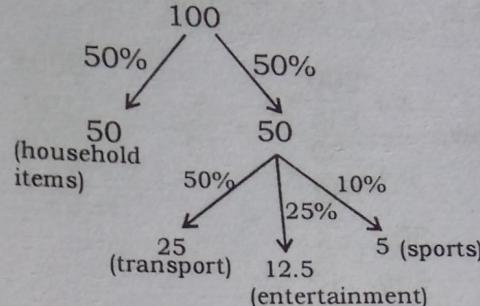
$$\Rightarrow x = ₹ 12000$$

Paramount Concept:- Indirect process-

$$\text{So, } 900 \times \frac{100}{(100-50)} \times \frac{100}{100-(50+25+10)} \\ 900 \times \frac{100}{50} \times \frac{100}{15} = ₹ 12000$$

Paramount Concept:- 2

Let income be ₹ 100



Remaining = Income - all expenditures

$$100 - (50 + 25 + 12.5 + 5) = ₹ 7.5$$

↓ × 120 (times)

$$₹ 900 \text{ (given)}$$

∴ Income = ₹ 100 × 120 = ₹ 12000

(7.5 is multiplied by 120 to get 900.
Income therefore also multiplied by 120)

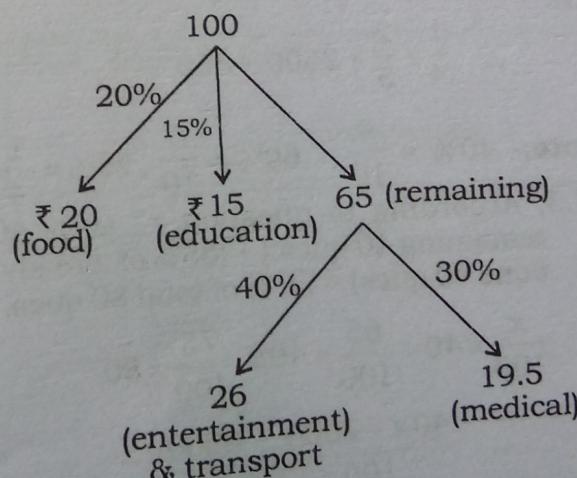
14.5; Short Trick:

$$30\% \text{ of } 65\% = 8775 \Rightarrow 100\%$$

$$= \frac{8775 \times 100 \times 100}{30 \times 65} = ₹ 45,000$$

2nd Method:-

Let his income be ₹ 100



$$\text{Final saving} = 100 - 20 - 15 - 26 - 19.5 \\ = ₹ 19.5$$

↓ × 450 (times)
₹ 8775 (given)

∴ Income = ₹ 100 × 450 = ₹ 45000
(Hence 100 is multiplied by 450 to get the original income)

15.2; Let the fraction = $\frac{x}{y}$

$$\text{Now, } \frac{x + \frac{200}{100} \times x}{y + \frac{350}{100} \times y} = \frac{5}{12} \Rightarrow \frac{\frac{300x}{100}}{\frac{450y}{100}} = \frac{5}{12}$$

$$\frac{30x}{45y} = \frac{5}{12}$$

$$\therefore \frac{x}{y} = \frac{5 \times 45}{12 \times 30} = \frac{5}{8}$$

15.2; Paramount Concept:-

Let the original fraction by $\frac{x}{y}$

$$\frac{x \times (100+200)\%}{y \times (100+350)\%} = \frac{5}{12}$$

$$\frac{x \times 300}{y \times 450} = \frac{5}{12} \text{ then } \frac{x}{y} = \frac{5}{8}$$

16.4; $\frac{4}{10} \times \frac{6}{10} \times \frac{3}{5} \times x = 504$
∴ $x = 3500$

$$\therefore \frac{1}{4} \times \frac{2}{5} \times 3500 = 350$$

Note:- $40\% = \frac{4}{10}$, $60\% = \frac{6}{10}$, $25\% = \frac{1}{4}$

17.5; According to question = ($x\%$ of remaining 40 ques.) + (65% of already done 40 ques) = 75% of total 80 ques.

$$\frac{x}{100} \times 40 + \frac{65}{100} \times 40 = \frac{75}{100} \times 80$$

$$\frac{40x + 2600}{100} = \frac{6000}{100}$$

$$40x + 2600 = 6000$$

$$40x = 3400$$

$$x = \frac{3400}{40} = 85\%$$

2nd Method:-

$$65\% \text{ of } 40 \text{ questions} = \frac{65}{100} \times 40 \\ = 26 \text{ questions}$$

Thus, she gets 26 marks
But she needs to score 75% of 80

$$= \frac{75}{100} \times 80 = 60 \text{ marks}$$

∴ Req. marks = 60 - 26 = 34 marks

Now, $x\%$ of 40 = 34

$$\Rightarrow x = \frac{34 \times 100}{40} = 85\%$$

18. 1; Let fraction be = $\frac{x}{y}$

$$= \frac{x + 2x}{y + 4y} = \frac{21}{20} \Rightarrow \frac{x}{y} = \frac{7}{4} = 1\frac{3}{4}$$

19.5; Short Trick:

$$\frac{35}{100} \times \frac{42}{100} \times \frac{6}{7} \times 500 = 63$$

20.3; Short Trick:

$$65 \times 20\% \text{ of } 65 + 4 \times 40\% \text{ of } 65 \\ 65 \times 13 + 4 \times 26 = 949$$

2nd Method:-

Each student gets $\frac{20}{100} \times 65$ sweets

i.e. 13 sweets

Each teacher gets $\frac{40}{100} \times 65$ sweets

i.e. 26 sweets

∴ No. of sweets

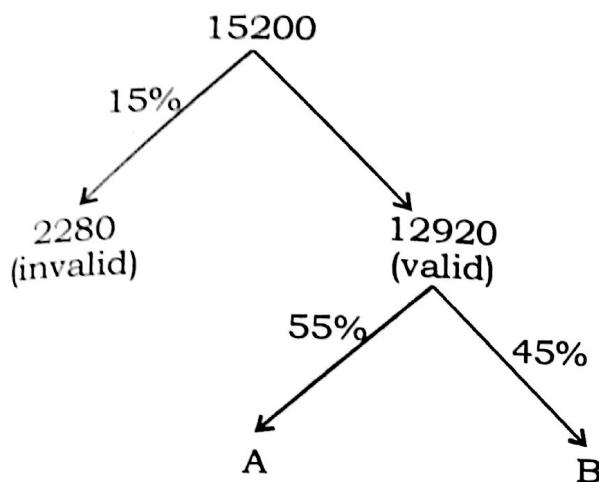
$$= \left(\underbrace{65 \times 13}_{\text{for students}} \right) + \left(\underbrace{4 \times 26}_{\text{for teachers}} \right) = 949$$

21.4; Short Trick:

$$\text{Valid votes} = \frac{85}{100} \times 15200 = 12920$$

$$45\% \text{ of valid votes} = \frac{45}{100} \times 12920 = 5814$$

Paramount Concept:-



B (less) get 45% of 12920 votes

$$\text{i.e. } \frac{45}{100} \times 12920 = 5814 \text{ votes}$$

22.2; Short Trick:

$$\frac{15}{100} \times \frac{45}{100} \times x = 105.3 \Rightarrow x = 1560$$

$$\frac{24}{100} \times 1560 = 374.4$$

23.1; Let fraction = $\frac{x}{y}$

$$\frac{x + \frac{220}{100}x}{y + \frac{150}{100}y} \Rightarrow \frac{3.20x}{2.50y} \Rightarrow \frac{32x}{25y} = \frac{4}{5}$$

$$\Rightarrow \frac{x}{y} = \frac{5}{8}$$

Paramount Concept:-

$$24.2; 60 \% \text{ of } 250 = 150$$

$$\therefore 150 - \frac{40}{100} \times 125 = 100$$

$$= \frac{100}{125} \times 100 = 80\%$$

24.2; 1st Method:-

Total correct questions for getting 60% grade

$$= \frac{60}{100} \times 250 = 150$$

40% of 125 = 50 questions

$$\therefore x\% \text{ of } 125 = 150 - 50 = 100 \text{ questions}$$

$$\Rightarrow x = \frac{100}{125} \times 100 = 80$$

Required percentage = 80%

2nd Method:-

A.T.Q., :-

$$40\% \text{ of } 125 + x\% \text{ of } 125 = \frac{60}{100} \times 250$$

$$\frac{40}{100} \times 125 + \frac{x}{100} \times 125 = \frac{60 \times 250}{100}$$

$$5000 + 125x = 15,000$$

$$125x = 10,000$$

$$x = \frac{10,000}{125}$$

$$= \frac{400}{5} = 80\%$$

25.3; Short Trick :

$$\frac{27}{100} \times \frac{36}{100} \times \frac{5}{9} \times 4500 = 243$$

26.1; Let the fraction be $\frac{x}{y}$.

$$\therefore \frac{x+3x}{y+y} = \frac{30}{19}$$

$$\therefore 76x = 60y$$

$$\therefore \frac{x}{y} = \frac{60}{76} = \frac{15}{19}$$

29.1; $\frac{1}{3}x = 96 \Rightarrow x = 288$

$$\frac{67}{100} \times 288 = 192.96$$

30.5; Short Trick:

Let original fraction = $\frac{x}{y}$

$$\frac{40x}{25y} = \frac{3}{5} \Rightarrow \frac{x}{y} = \frac{3}{8}$$

30.5; Let the fraction be $\frac{x}{y}$

$$\therefore \frac{x+3x}{y+1.5y} = \frac{3}{5} \Rightarrow \frac{4x}{2.5y} = \frac{3}{5}$$

$$\therefore \frac{x}{y} = \frac{3}{4} \times \frac{2.5}{4} = \frac{3}{8}$$

31.1; Short Trick :

Instead of quadratic equation formation, we go with assumption. With given condition only 2 numbers are possible.

| By interchanging | Diff. |
|------------------|------------------|
| 24 | 42 |
| 39 | 93 |
| ∴ No. is 39 | 40% of 39 = 15.6 |

31.1; **No:-** $10x + y$ (ten's place is multiplied by 10 because suppose the number is 53. This means $50 + 3$ or $10 \times 5 + 3$)

(Hence xy means $10x + y$)

According to question the number be $10x + x^2$

$$\therefore (10x + x^2) \sim (10x^2 + x) = 54$$

32.2; Short Trick:

$$+ 15\% - 10\% + (+ 15\%) \text{ of } (-10\%) \\ + 5\% - 1.5 = 3.5\% \text{ (increase)}$$

2nd Method:-

$$H_1 = 100 \quad H_2 = 115$$

$$R_1 = 100 \quad R_2 = 90$$

Curved surface area = πrh

$$\begin{aligned} \pi R_1 H_1 &= \pi R_2 H_2 \\ \Rightarrow 100 \times 100 &\Rightarrow 115 \times 90 \\ \Rightarrow 10,000 &\Rightarrow 10350 \\ \Rightarrow 200 &\Rightarrow 207 \\ \text{increase} &= 207 - 200 = 7 \end{aligned}$$

$$\% \text{ Increase} = \frac{\text{increase}}{\text{original}} \times 100 \%$$

$$= \frac{7}{200} \times 100 = 3.5\%$$

3rd Method:-

$$15\% = \frac{3}{20}$$

$$\begin{array}{ccc} h & \text{Old} & : & \text{New} \\ 20 & \rightarrow & & 23 \end{array}$$

$$10\% = \frac{1}{10}$$

$$\begin{array}{ccc} r & \text{Old} & : & \text{New} \\ 10 & \rightarrow & & 9 \end{array}$$

$$(SA) \quad \text{Old} : \text{New}$$

$$(rh) \quad 20 \rightarrow 23$$

$$\frac{\times 10}{200} \rightarrow \frac{9}{207}$$

$$\text{increase \% } \frac{7}{200} \times 100 = 3.5\%$$

34.1; Let the total marks be x , then from problem

According to question :-

$$\frac{30}{100} \times x + 5 = \frac{40}{100} \times x - 10$$

$$\frac{30x + 500}{100} = \frac{40x - 1000}{100}$$

$$10x = 1500$$

$$x = 150$$

Pass marks = 30% of $x + 5$

$$= \frac{30}{100} \times 150 + 5 = 50 \text{ marks}$$

35.3; Short Trick:

25% (only english) + 35% (both) of 60

$$60\% \text{ of } 60 = 36$$

35.3; Number of students who can speak:

$$\text{Only Hindi} = \frac{40}{100} \times 60 = 24$$

$$\text{Only English} = \frac{25}{100} \times 60 = 15$$

$$\begin{aligned}\text{Both languages} &= 60 - (24 + 15) \\ &= 21\end{aligned}$$

\therefore Number of students who can speak English = $15 + 21 = 36$

36.4; Short Trick:

$$\text{Remaining} = 20\% = 500$$

$$\text{Total} = 100\% = 2500$$

36.4; Remaining percentage of books

$$= 100 - (30 + 50) = 20$$

According to the question,

$$20\% \text{ of total books} = 500$$

\therefore Total books i.e. = 100%

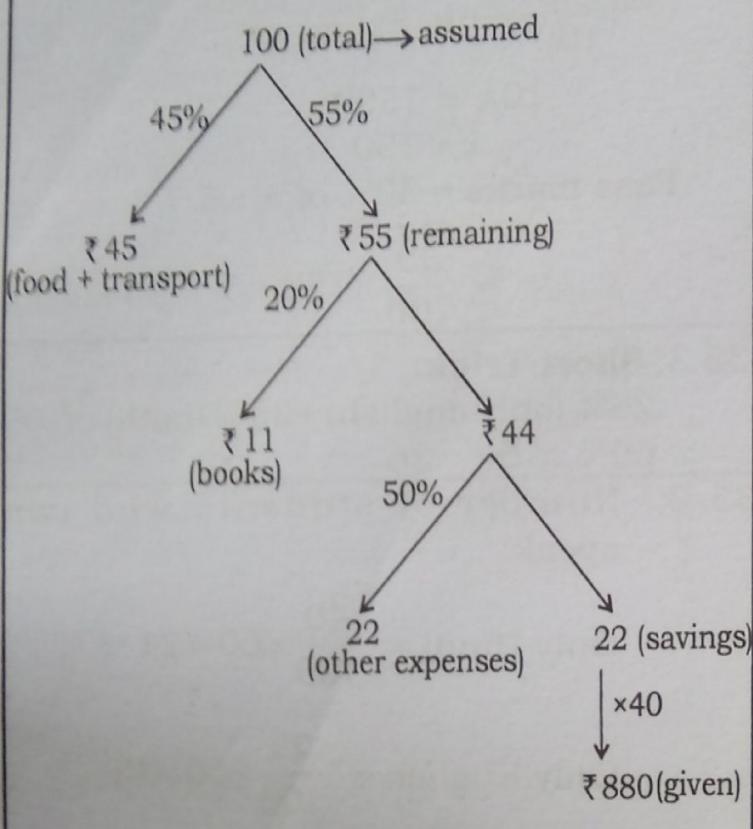
$$= \frac{100 \times 500}{20} = 2500$$

37.2; Short Trick:

$$55\% \text{ of } 8 \times 100 = 440$$

$$\text{English} = 15\% \text{ of } 440 = 66$$

38.5; Paramount Concept:-



$\therefore \text{Income} = ₹ 100 \times 40 = ₹ 4000$
 (Since 22 when multiplied by 40 is 880)
 (Hence Income should also be multiplied by 40)

39. 4; Let the number be x

Now, according to the question,

$$65\% \text{ of } x - 36\% \text{ of } x = 58$$

$$\text{or, } (65\% - 36\%) \text{ of } x = 58$$

$$\text{or, } 29\% \text{ of } x = 58$$

$$\text{or, } x = \frac{58 \times 100}{29} = 200$$

$$\text{Now, } 23\% \text{ of the number} = 23\% \text{ of } 200 \\ = 46$$

40.3; He spends = 40% + 20% + 50% of

$$\text{remaining} = 40\% + 20\% + \frac{50}{100} \times 40\%$$

$$40\% + 20\% + 20\% = 90\%$$

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

$$10\% = 450/-$$

$$100\% = 4500/-$$

41.2; Suppose he has ₹ 100/-
 wife gets = ₹ 35/-
 sons gets = ₹ 50/-
 He saves = $100 - (35 + 50)$
 $= 100 - 85 = 15/-$
 If 15/- = 1250

$$\text{then, } 100/- = \frac{100 \times 1250}{15} \\ = ₹ 7500/-$$

42.2; Paramount Concept:-

$$50\% = \frac{1}{2}; \quad 60\% = \frac{3}{5}$$

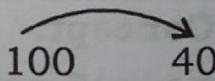
| | Old | New |
|-----------|----------------|----------------------|
| r | 2 | $\xrightarrow{-1}$ 1 |
| h | 5 | $\xrightarrow{+3}$ 8 |
| Vol:- | Old | New |
| $(r^2 h)$ | $r = 2$ | 1 |
| r | 2 | 1 |
| h | $\frac{5}{20}$ | $\frac{8}{8}$ |

$$\text{Req. \%} = \frac{20 - 8}{20} \times 100 = 60\%$$

42.2; Paramount Concept:- 2

Let the old volume cylinder is 100

$$\text{then, } 100 \times \frac{50}{100} \times \frac{50}{100} \times \frac{160}{100} \\ = 40$$



Hence decrease = 60%

42.2; 2nd method:

$$\text{Original volume} = \pi \times 2 \times 2 \times 5 = 20\pi$$

$$\text{New volume} = \pi \times 1 \times 1 \times 8 = 8\pi$$

$$\text{Decrease \%} = \frac{\text{Decrease}}{\text{original}} \times 100$$

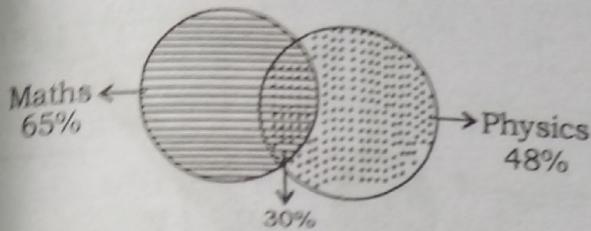
$$= \frac{12\pi}{20\pi} \times 100 = 60\%$$

43.1; $n(M) = 65, n(P) = 48, n(M \cap P) = 30$

$$\therefore n(M \cup P) = n(M) + n(P) - n(M \cap P) = 65 + 48 - 30 = 83$$

\therefore Percent of students passed = 83
 \therefore Percent of students failed = 17

2nd Method:-



$$\text{Only maths} = 65 - 30 = 35\%$$

$$\text{Only Physics} = 48 - 30 = 18\%$$

$$\text{Both} = 30\%$$

$$\text{Failed in both} = 100 - (35 + 18 + 30) = 100 - 83 = 17\%$$

43.1 Short Trick:

$$\text{Math} = + 65\%$$

$$\text{Physics} = + 48\%$$

$$\text{Both} = - 30$$

$$\text{Total pass} = \underline{83\%}$$

$$\text{Total fail} = 17\%$$

44.2; Short Trick:

$$\text{Families have cow} = + 60\%$$

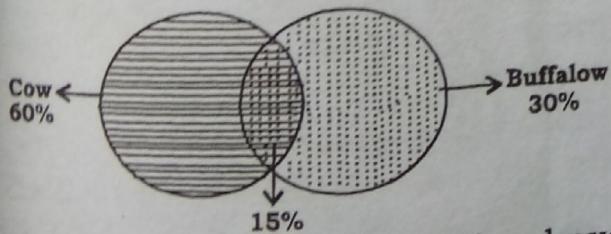
$$\text{Families have buffalow} = + 30\%$$

$$\text{Families have both} = - \underline{15\%}$$

$$\underline{75\%}$$

$$\text{Don't have any} = 25\% \text{ of } 96 = 24$$

2nd Method:-



Number of families that either have a cow or a buffalow = $60 + 30 - 15 = 75\%$

Number of families that have neither a cow nor a buffalow = $100 - 75\% = 25\%$

$$\text{Req. no.} = \frac{25}{100} \times 96 = 24$$

45.1; If a number is $x\%$ more than other, then the other number is less than the first

$$\text{number by } \frac{x}{100+x} \times 100\%$$

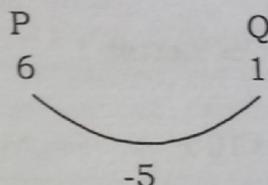
\therefore Required number

=

$$\frac{500}{100+500} \times 100 = \frac{500}{600} \times 600$$

$$= \frac{250}{3} = 83\frac{1}{3}\%$$

45.1; Short Trick:



$$\therefore \frac{5}{6} \times 100 = 83\frac{1}{3}\%$$

46.3; Short Trick:

$$\begin{aligned} &+ 20\% - 20\% + (+20\%) \text{ of } (-20\%) \\ &= - 4\% \end{aligned}$$

Paramount Concept:-

$$\text{Price (₹)} \times \text{Qty.(kg)} = \text{expense (₹)}$$

$$\text{old } 10 \times 10 = 100$$

$$\downarrow + 20\% \quad \downarrow -20\% \quad \downarrow - 4\text{₹}$$

$$\text{new } 12 \times 8 = 96$$

$$\% \text{ required} = \frac{-4}{100} \times 100 = - 4\% (\text{loss})$$

Paramount Concept:-2

$$\frac{20^2}{100} \text{ less} \Rightarrow 4\%$$