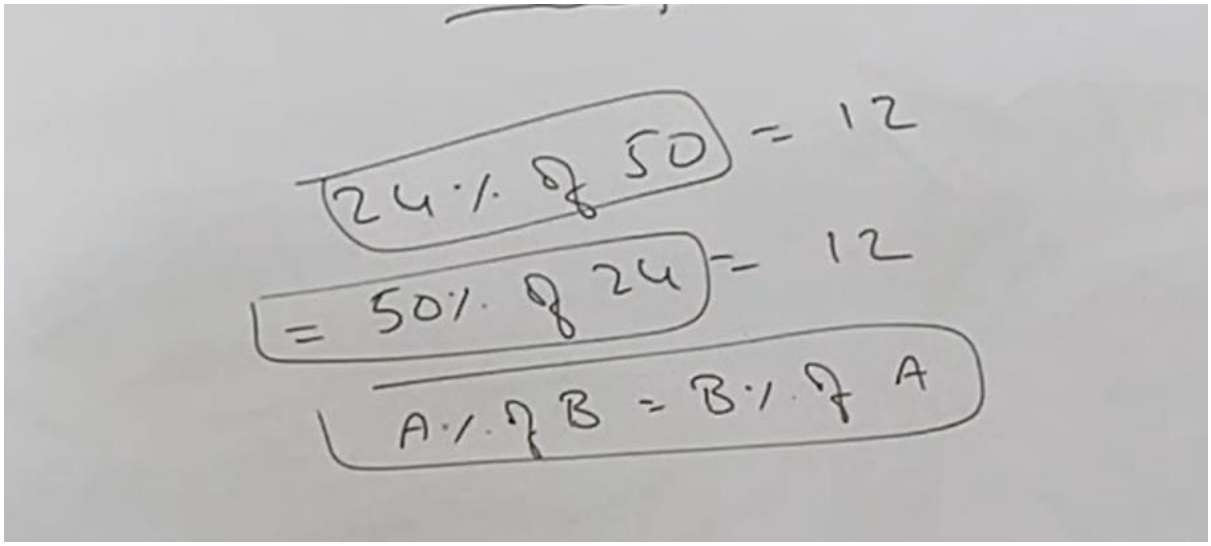
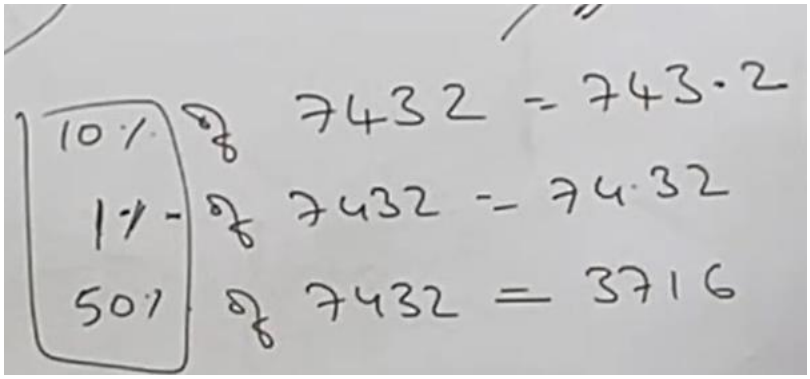
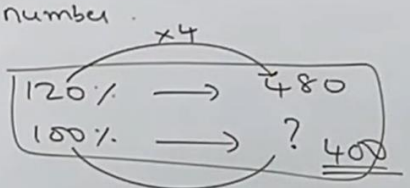
PERCENTAGES





When the no is increased by 20% of itself, the result is 480.
Find the number.

Sol:



If 40% of a number is 20 more than 30% of a number, find the number ?

Dif b/w 40% & 30% ⟶ 20

40%-30% ⇒ 10% ⟶ 20 (×2)

Number = 100% ⟶ ? 200 (×10, ×10)

'A' won the election by a majority of 150 votes. If only two candidates contested, & 'A' secured 60% of total votes, find the total no of votes ?

Sol:

A ⟶ 60%

-B ⟶ 40%

Majority ⟶ 20% ⟶ 150 votes

Total ⟶ 100% ⟶ ? 750 Votes (×5)

150×5

Price of Sugar first increased by 30% & then decreased by 30%. Find the original price if present price is Rs 273

O.P ⟶ 100%

+30 (30% of 100)

130%

-39 (30% of 130)

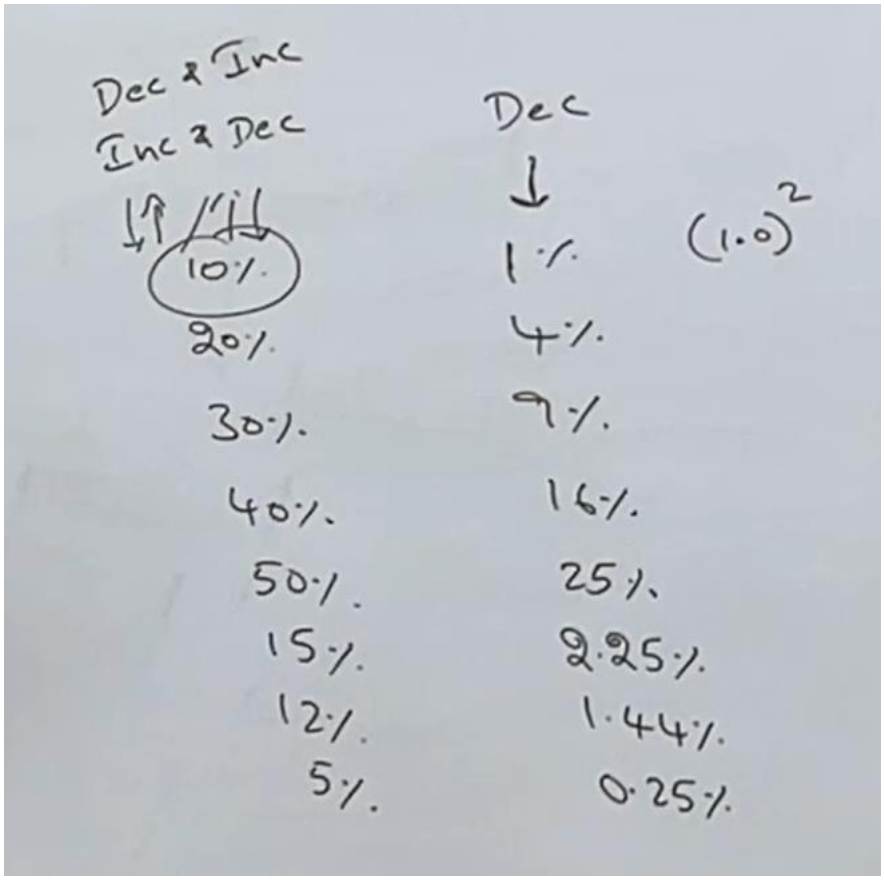
Present P ⟶ 91%

91% ⟶ 273 (×3)

100% ⟶ ? 300 (×3)

$\frac{273 \times 100}{91}$ = 300/-

10%	1%
20%	4%
30%	9%
40%	16%
50%	25%


Dec & Inc
Inc & Dec
10%
20%
30%.
40%.
50%.
15%.
12%.
5%.
Dec
1%.
4%.
9%.
16%.
25%.
2.25%.
1.44%.
0.25%.
$(1.0)^2$

10%.
20%.
30%.

21% → 10+10+1 | 10+10+(1.0)²
44% → 20+20+4 | 20+20+(2.0)²
69% → 30+30+9 | 30+30+(3.0)²

40% → 40+40+4.0² = 40+40+16
= 96%.

14% → 14+14+(1.4)² = 14+14+1.96
= 29.96%.

12% — 12+12+1.2² = 25.44%.
5% — 5+5+0.5² = 10.25%.
3% — 3+3+0.3² = 3+3+0.09 = 6.09%.

0.3
×0.3
0.09

10%	19%	$\rightarrow 10+10-(1.0)$
20%	36%	$- 20+20-(2.0)^2$
30%	51%	$\rightarrow 30+30-(3.0)^2$
5%	9.75%	$- 5+5-(0.5)^2$
12%	22.56%	$- 12+12-(1.2)^2$

$100 - 10 = 90$, $90 - 9 = 81$ → 19%

Percentages

If the area of a square becomes 3380 sq units after the side of the square increase by 30%. Find the original Area? (100%) → ?

Side → 30% ↑

Area → $30+30+3^2 \rightarrow 30+30+9 = 69\%$ ↑

0 Area — 100%

Area increase — 69%

New Area — 169%

×20

169% — 3380

100% — ? 2000 sq units

× 2

Percentages

R – 5% ↑ ↓

N.A → 441 Sq units

O.A → ? 400 Sq units

A ↑ → 5 + 5 + 0.5^2

→ 5 + 5 + 0.25

→ 10.25%

N.A → 100 + 10.25 → 110.25%

25, 50, 75, 00

÷ by 25

100 + 5 + 5 + 0.25

N.A	110.25%	—	441
O.A	100%	—	?

Information

Question

$$\frac{441 \times 100}{110.25} \times \frac{100}{100} = \frac{441 \times 100 \times 100}{11025} = 400 \text{ Sq units}$$

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⑧ Surya spends 60% of his salary on food. 20% of Remaining on Petrol. 10% of the remaining on Entertainment & saves the remaining amount. If he saves Rs 288, find his salary?

Sol.

Salary	100%	— ?
Food	– 60%	(60% of 100) – Food
Rem	40%	
Petrol	– 8	(20% of 40) – Petrol
Rem	32.0	
Ent	– 3.2	(10% of 32) – Ent
Sav	— 28.8%	— 288/-

→ ×10

Sav – 28.8% — 288

Sal – 10% — 1000

→ ×10

$$\frac{288 \times 100}{28.8} = 1000/-$$

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⑧ In a Library, 40% of books are in English. 20% of remaining are in Hindi. 60% of the remaining are in Telugu & the remaining 7200 books are in other languages. Find the total no. of books in the Library?

Sol:

Total	100%	
Eng	40%	(40% of 100)
Rem	60%	
Hindi	– 12%	(20% of 60)
Rem	— 48%	
Tel	— 28.8%	(60% of 48)
Rem	— 19.2%	— other lang

other langs. 19.2% — 7200

Total — 100% — ?

$$\frac{7200 \times 100}{19.2} \times \frac{10}{10} = \frac{7200 \times 100 \times 10}{192}$$

300 25

2 48

Total — $\frac{75000}{2}$ = 37500

Percentages

(8) In a Library, 40% of books are in English 20% of remaining are in Hindi. 60% of the remaining are in Telugu & the remaining 7200 books are in other languages. Find the total no. of books in the Library?

Big No → Small No.

Sol:

Sequence is Not imp

% * 5 & 5 = 0.5^2

40% & 40 = 4^2

20% & 20 = 2^2

30% & 30 = 3^2

13% & 13 = 1.3^2

100
− 60 (60% of 100)
40
− 16 (40% of 40)
24
− 4.8 (20% of 24)
19.2%.

other langs. 19.2% — 7200

Total — 100% — ?

$\frac{7200 \times 100}{19.2} \times \frac{10}{10} = \frac{7200 \times 100 \times 10}{192}$ (300 25, 2 4 8)

Total — $\frac{75000}{2}$ = 37500

---

(8) In a market survey, 20% opted for Product A whereas 60% opted for Product B. The remaining individuals were not certain. If the difference b/w those who opted for product B & those who were not certain was 720, how many individuals were covered in the survey? (100%)

T

A — 20%
B — 60%
→ 80%
Not certain — 20%
100%

B — 60%.
N.C — 20%.
Dif — 40% — 720
100% — ?

40% — 720
100% — ?

$\frac{720 \times 100}{40}$ (180) = 1800

Percentages

In a competitive exam in state A, 6% got selected from appd candidates. State B had equal no of candidates appeared & 7% got selected with 80 more candidates got selected than A. what was the no. of candidates appeared from each state?

7% − 6% → 1% —(×80)— 80

100% —(×80)— 8000

Percentages

(Q) In an election b/w two candidates, one got 55% of total valid votes. 20% of the votes were invalid. Total No of votes were 7500, the no of valid votes that the other candidate got?

A − 55%

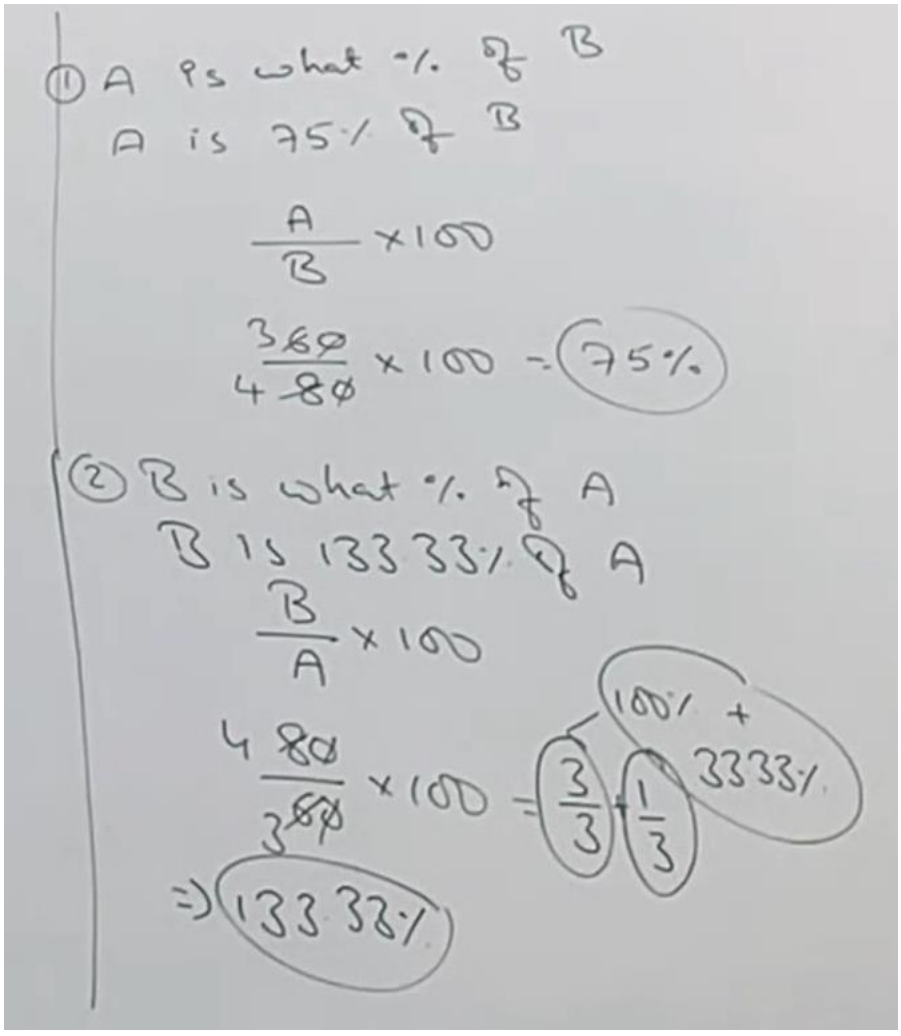
B − 45% of valid votes (80%)

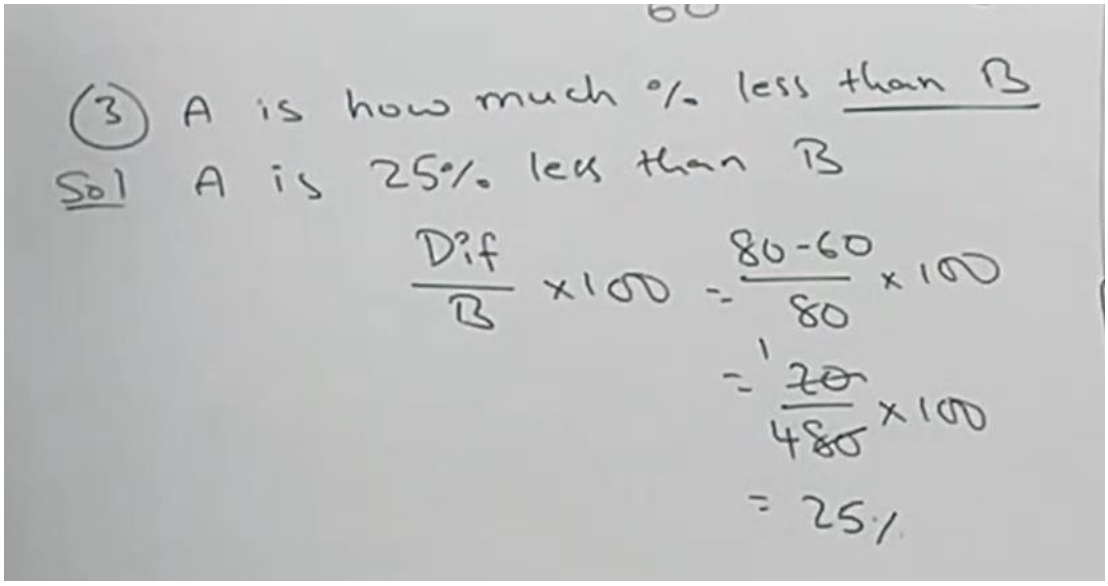
40% — 3000

− 4% — 300

36% — 2700

B → 45% of 80 → 36% of 7500 = 2700


(1) A is what % of B
A is 75% of B
$\frac{A}{B} \times 100$
$\frac{360}{480} \times 100 = 75\%$
(2) B is what % of A
B is 133.33% of A
$\frac{B}{A} \times 100$
$\frac{480}{360} \times 100 = 100\% + 33.33\%$
$\frac{3}{3} + \frac{1}{3}$
$\Rightarrow 133.33\%$


(3) A is how much % less than B
Sol A is 25% less than B
$\frac{Dif}{B} \times 100 = \frac{80-60}{80} \times 100$
$= \frac{20}{480} \times 100$
$= 25\%$

B = 80

(4) B is how much % more than A

$= \frac{20}{480} \times 100$

$= 25\%$

B is 33.33% more than A

$\frac{\text{Dif}}{A} \times 100 = \frac{80-60}{60} \times 100 = \frac{20}{60} \times 100 = 33.33\%$

A's salary is 80% more than B

B's salary is ?% less than A

Sol $\frac{80}{100+80} \times 100 = \frac{480}{180} \times 100 = 44.44\%$

$\rightarrow 44\frac{4}{9}\%$ less

Salary of A increased by 20%. By what % should the salary get decreased so that his salary would come back to the original salary.

100 → 120 — 100

$\frac{20}{120} \times 100 = 16.66\%$ (or) $16\frac{2}{3}\%$

Salary of A decreased by 40%. By what % should the salary get increased so that his salary would come back to the original salary.

$100 \rightarrow 60 \rightarrow 100$

$\frac{40}{60} \times 100 = 66.66\%$

or

$66\frac{2}{3}\%$.

***

Price of sugar increased by 40%. By what % should the family reduce the consumption of such so that the expenditure on sugar remains same.

$A = L \times B$

$R = P \times S$

$E = P \times C$

$100 \rightarrow 140 \rightarrow 100$

$E = 100 \times 100 = 10000$

$= 140 \times ? = 10000$

$x = \frac{10000}{140} = \frac{5}{7} \times 100 = 71.42\%$

28.58%.

100.00

71.42

28.58

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

$= 28.57\%$.

Present population of a town is 62500. Due to migration to big cities, it decreases every year by 4%. Find the population of town after 2 years.

62500

1st year $-\ 2500$ (4% of 62500)

60000

2nd year $-\ 2400$ (4% of 60000)

57600

A student has to score 33% marks to pass. He got 90 but failed by 9 marks. Find max marks.

Pass % = 33%

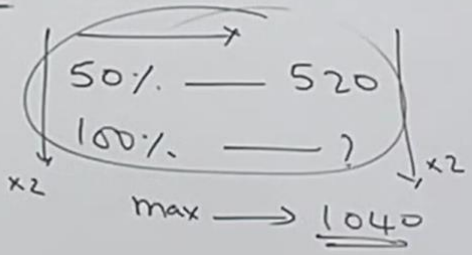
Pass marks = 90+9

33% ——— 99 marks (×3)

100% ——— ? 300 marks (×3)

In an exam, 9t is required to get 55% to pass & student get 520 marks & declared as failed by 5%. Find max marks. (100%)

Sol:



Abhinav got 38% & failed by 14 marks.
Ravi got 43%, which is 21 marks more than pass mark.
Find pass % & max marks.

40%
700%
% dif
marks dif

(43% - 38%) → 5% ×7 — 35 marks
100% — 700 marks
×7

Abinav — 38% + 14 marks → pass %
→ 38% + 2% → 40%
Ravi → 43% - 21 marks — pass %
43% - 3% — 40%

21 - (-14) = 21 + 14
= 35 marks

100 marks
(21 - (-14)) You — 86
Me — 121
Dif — 35

700 — 100%
14 — ?%
21 — ?

$\frac{168 \times 21}{700}$ %

Y. Pathan scored 120 Runs which included 3 Fours & 8 Sixes. Find the % of Runs he scored by running b/w the wickets.

3 × 4 = 12
8 × 6 = 48
Total — 120 - 60 (Boundaries)
= $\frac{60}{120} \times 100$ = 50%

If Numerator is increased by 20% & denominator decreased by 10% the resultant fraction is $\frac{16}{21}$. Find original fraction.

$$\frac{4\cancel{12}\cancel{0}\times\cancel{8}x}{3\cancel{6}\cancel{0}\times\cancel{8}y} = \frac{16}{21}$$

$$\frac{4x}{3y} = \frac{16}{21} \Rightarrow \frac{x}{y} = \frac{\overset{4}{\cancel{16}}\times\cancel{3}}{\underset{7}{\cancel{21}}\times\cancel{4}} = \frac{4}{7}$$

Percentages

** A man spends (Exp) 75% of his income. His income increased by 20% & he increased his expenditure by 10%. Find the % change in his savings.

Sol:

	I	−	E	=	S	
original →	100	−	75	=	25	12.5
New →	120	−	82.5	=	37.5	

10% of 75 = 7.5

Exp → 75

7.5 (10% of 75)

N.E — 82.5%.

$$\frac{\text{Dif}}{\text{Orig Sav}} \times 100 = \frac{\cancel{12.5}^{1}}{\underset{2}{\cancel{25}}} \times 100$$

$$= 50\%$$

** A man spends 60% of his income. His income increased by 40% & he increased his expenditure by 50%. Find the % change in his savings.

Exp

	Inc	−	Exp	=	Sav
Original	100	−	60	=	40
New	140	−	90	=	50

Orig Exp 60
Inc +30 (50% of 60)
New Exp 90

$\frac{10}{40} \times 100 = 25\%$

Percentages

In an exam, there were 2000 candidates out of which 900 were boys. If 32% of the boys passed & 38% of girls passed. Find the % of failed candidates.

Fail

Boys	900	68% of 900 →	612
Girls	1100	62% of 1100 →	682
		Failed →	1294

$\frac{647}{2000} \times 100$
$= 64.7\%$

Two numbers are 20% & 30% of third number. How much % of first number is second number.

A	B	C
20	30	100

$\frac{30}{20} \times 100 = 150\%$

There are three numbers of which first no is 40% more than second no & second no is 20% more than third. How much % of the third no is the first.

A	B	C
168	120	100
	(40% of 120)	
	+48	

C — 100
+20 (20% of 100)
B — 120
+48 (40% of 120)
A — 168

$\frac{168}{100} \times 100 = 168\%$

Of the three numbers, the first no is 25% less than second no & the second no is 60% more than the third. By how much % is the first no more or less than the third no.

C — 100
+60 (60% of 100)
B — 160
-40 (25% of 160)
A — 120

A 120 B 160 C 100

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

+20% more

The production of a company is decreased by 10% & then increased by 30%. Find the % change.

100%
- 10 (10% of 100)
90
+ 27 (30% of 90)
→ 117%

17% inc

Length increased by 60%. Breadth decreased by 20%. Find % change in Area.

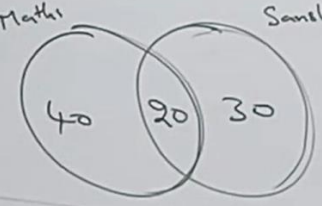
100%
+60 (60% of 100)
160
- 32 (20% of 160)
→ 128%

28% inc

In a college, 40% of students pass in mathematics. 50% of students pass in Sanskrit. But 20% fail in both. Find % of students passed in both.

Failed

Fail
only M - 40
only S - 30
Both - 20
100 - 90



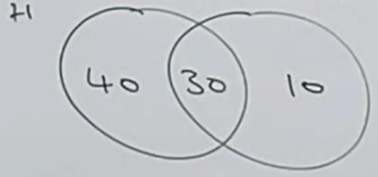
=> 10% passed in both

	P	F
M	40%	60%
S	50%	50%

Percentages

In a town, 70% of citizens read Hindu. 40% read TOI & 30% read both. Find % of citizens who read neither.

Read

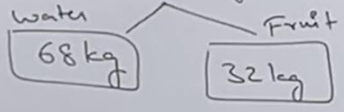


H B TOI
40 + 30 + 10
= 80%.

100 - 80% — 20%
neither

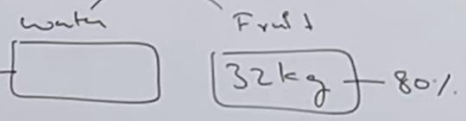
Fresh fruit contains 68% water & dry fruit contains 20% water. How much dry fruit can be obtain from 100 kg of fresh fruit

Fresh Fruit
100 kg



80% — 32 kg
100% — ?

Dry Fruit
40kg — 100%



$\frac{32 \times 100}{80} = 40\text{kg}$