

12/1/2012

Percentage

* assign the value

$$250\% \rightarrow 1 \frac{1}{3} \rightarrow \frac{4}{3}$$

Normal cond. Damaged bill Rs 2800 Mind calculation

50%

50% of 2800

(x)

$$\frac{50}{100} \times 2800 = 1400$$

$$\frac{2700}{2 \times 50\%} = 100$$

$$50\% = \frac{2800}{2}$$

25%

25% of 2800

$$4 \times 25\% = 100\%$$

$$25\% = \frac{100\%}{4}$$

$$\frac{25}{100} \times 2800 =$$

10% of 2800

$$100\% = 2800$$

10%

$$\frac{10}{100} \times 2800 = 280$$

$$10\% = 280$$

do white loop in process \rightarrow check

1%

1% of 2800

$$100\% = 2800$$

$$\frac{1}{100} \times 2800 = 28$$

$$1\% = 28$$

points (1%)

Advance

9 white (i.e. 1)

$$20\% \text{ of } 2800 + 5\% \text{ of } 2800$$

35%

for 35% (i.e. 0.35) i.e. $\frac{35}{100} \times 2800$

$$20\% \text{ of } 2800 + 3\% \text{ of } 2800$$

$$= 980 \text{ int. (i.e.)}$$

$$= 980$$

23%

23% of 2800

$$\frac{23}{100} \times 2800 = \frac{56}{644}$$

$$20\% \text{ of } 2800 + 3\% \text{ of } 2800$$

$$560 + 84$$

$$644$$

$$644$$

~~property~~ $i = 0$; $i \leq 10$; $n++$ X

X% of ydt, i) i.e. of x

eg
Ques:

$$36\% \text{ of } 50 = ?$$

$$= 50\% \text{ of } 36$$

$$36/2 = 18$$

$$= 18$$

$$36\% \text{ of } 50 = \frac{36}{100} \times 50 = 18$$

$$50\% \text{ of } 36 = \frac{50}{100} \times 36 = 18$$

$$20\% \text{ of } 90 = \frac{20}{100} \times 90 = 18$$

$$90\% \text{ of } 20 = \frac{90}{100} \times 20 = 18$$

Lesson 2 9th term another term
1) $50\% \text{ of } P = 25\% \text{ of } Q$

then $P = x\% \text{ of } Q$. find x
cancel '%'

$$250\% \text{ of } P = 25\% \text{ of } Q$$

$$P = \frac{Q}{2}$$

take

$$P = x\% \text{ of } Q$$

$$\frac{Q}{2} = x\% \text{ of } Q$$

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

$$\frac{100}{2} = x$$

$$50 = x$$

2) $20\% \text{ of } (P+Q) = 50\% \text{ of } (P-Q)$ \rightarrow expression

Find $P : Q$

$$2Q \times (P+Q) = 5Q \times (P-Q)$$

$$2(P+Q) = 5(P-Q)$$

$$2P + 2Q = 5P - 5Q$$

$$\frac{P}{Q} = \frac{7}{2}$$

$$5Q + 2Q = 5P - 2P$$

$$7Q = 3P$$

$$7 : 3$$

3) 90% of A = 30% of B

& B = 2x% of A

Find x

$$3 \cancel{10} x \times A = 30x \text{ of } B$$

$$\boxed{3A = B}$$

$$\cancel{2} \cancel{A} = \cancel{2} x \cancel{x} \cancel{A}$$

100
So

$$\boxed{x = 25}$$

$$\frac{3A = 2x \times A}{100}$$

So

$$\boxed{50 = x}$$

$$\boxed{150 = x}$$

4) 40% of (A+B) = 60% of (A-B)

then $\frac{2A - 3B}{A+B}$

$$4\cancel{10} x. (A+B) = 6\cancel{10} x. \text{ of } (A-B)$$

$$2(A+B) = 3(A-B)$$

$$2(A+B) = \frac{3}{2}(A-B)$$

$$2A + 2B = 3A - 3B$$

$$= 2 \times (3A - 3B)$$

$$2A + 3B = 3A - 2A$$

$$5B = A$$

$$\frac{2(A+B) - 3B}{5A + B} = \frac{7B}{6B}$$

$$7/6$$

5) 20% of $a = 80\% \text{ of } b$

$$\frac{(b+a)}{(b-a)}$$

X

$$20 \times a = 80 \times b$$

$$a = 4b$$

$$\frac{b+4b}{b-4b} = \frac{5b}{-3b} = -5/3$$

Change

6) $20\% \text{ of } (A+B) = 50\% \text{ of } B$

$$2A + 2B = 5B$$

$$2A = 3B$$

$$B = \frac{2}{3}A$$

$$\frac{2A - B}{2A + B} = \frac{2A - \cancel{B}}{\cancel{2A} + B} = \frac{2A}{2} = A$$

$$\frac{2A - (\frac{2A}{3})}{2A} = \frac{2(\frac{2B}{3} - B)}{2B} = \frac{2A(\frac{2B}{3} - B)}{2A} + B$$

$$\frac{3B - B}{3B + B} = \frac{2B}{4B} = \frac{1}{2}$$

$\text{Ans} = \frac{1}{2}$

-X

7) x is 20% less than y → ~~Key point~~ less than y

$$\frac{y-x}{y} = \frac{x}{x-y}$$

~~Take~~ $y = 100$ so $y = 20\% x$ less than y

$$so x = 80$$

Take $y = 100$ put $x = 80$ because $x = \frac{80}{100} y$

$$\frac{y-x}{y} = \frac{100-80}{100} = \frac{20}{100} = \frac{1}{5}$$

$\boxed{\frac{1}{5} \text{ is } -4}$

$$\frac{x}{x-y} = \frac{80}{80-100} = \frac{-80}{-20} = -4$$

$$8) 8\% \text{ of } x = 4\% \text{ of } y$$

then $20\% \text{ of } x = ?$

$$8\% \text{ of } x = 4\% \text{ of } y$$

$$\boxed{2x = y}$$

$$= 20\% \text{ of } x$$

$$20\% \text{ of } \frac{y}{2}$$

$$\frac{2x}{100} \times \frac{y}{2}$$

$$\boxed{= 10\% \text{ of } y}$$

(or) another method

$$8\% \text{ of } x = 4\% \text{ of } y$$

$$2\% \text{ of } x = 1\% \text{ of } y$$

then

$$\boxed{20\% \text{ of } x = 10\% \text{ of } y}$$

1) 3 expression

$$60\% \text{ of } A = 30\% \text{ of } B$$

$$B = 40\% \text{ of } C$$

$$C = x\% \text{ of } A$$

find value of x

$$60\% \text{ of } A = 30\% \text{ of } B$$

$$\boxed{2A = B}$$

~~$$B = 40\% \text{ of } C$$~~

$$2A = 40\% \text{ of } C$$

$$\frac{2A}{40\%} = C$$

$$\frac{2A}{(40\%)} = C$$

$$\boxed{SA = C}$$

$$\frac{2A}{40\%} = x\% \text{ of } X$$

$$SA = x\% \text{ of } X$$

$$\frac{2 \times 100}{40 \times 100} = x$$

$$\boxed{500 = x}$$

$$1000 =$$

$B = x\% \text{ of } C$

$$\& A = \frac{x}{100} \times C$$

$$A = \frac{x}{5}$$

$C = x\% \text{ of } A$

$$\& C = x\% \times \frac{A}{5}$$

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

$$500 = x$$

Lesson 1

What Percentage (see what %)

then more (a) less

→ like pattern

Formula 1

$$x \text{ is what \% of } y = \frac{x}{y} \times 100$$

$$\text{what \% of } x \text{ is } y = \frac{y}{x} \times 100$$

that ^{ex} || of || than

Formula 2:

$$x \text{ is what \% more or less than } y = \frac{x-y}{y} \times 100$$

positive negative

Ans = + (a) -
more less

1) If x is 10% more than y , then by what percent is y less than x ?

formula 2: more or less

x is more than 10% of y

x y take y as 100

110%. 100%.

then is near to ~~x in~~ second term, so

$$\frac{x-y}{y} \times 100 = \frac{y-x}{x} \times 100$$

$$\frac{100-110}{110} \times 100$$

$$-\frac{10}{110} \times 100$$

$$= -\frac{100}{11} = -9\frac{1}{11}\%$$

$-9\frac{1}{11}$ less than x

2) If A's height is 10% more than B's height, by how much percent less is B's height than that of

$$110\% \quad 100\%$$

than no "that" is hear, search for "of"



hear of is near to A

$$\begin{aligned} &= \frac{B - A}{A} \times 100 \\ &= \frac{100 - 110}{110} \times 100 \\ &= -\frac{10}{11} = -9\frac{1}{11}\% \end{aligned}$$

-
- 3) B got 20% marks less than A. what percent marks did A got more than B?

$$\begin{array}{ll} B & A \\ 80 & 100 \end{array}$$

than is near to B

$$\frac{A - B}{B} \times 100 = \frac{100 - 80}{80} \times 100$$

$$= \frac{20}{4} \times 5 = 25$$

$$= 25\%$$

4) If x earns 25% more than y . What percent less does y earn than x ?

$$\begin{array}{r} x \\ \text{---} \\ 125 \\ \text{---} \\ y \end{array}$$

Then y is near to x

$$= \frac{y-x}{x} \times 100$$

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

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

$$= -20$$

$$= 20\% \text{ less}$$

5) Two numbers are respectively 12 ($\frac{1}{2}\%$) & 25% more than a third number. The first number is what percentage of second number is

a	b	c
$12\frac{1}{2}\%$	25%	100
$\frac{25}{2}\%$		
12.5%	25%	100
112.5	125	100

formula 1

more is there but less is not present
So formula 1

formula of is near to second element

So

$$= \frac{22.5}{19.5} \times 100 = \frac{22.5}{19.5} \times 100 = 115\%$$

5 ~~50~~

$$= 90.0\%$$

- b) Two numbers are less than a third number by 30% & 37%, resp. The percent by which the second number is less than the first is

formula 2

$$\begin{array}{ccc} 70\% & 63\% & 100\% \\ A & B & C \end{array}$$

less than & again less than

$$= \frac{B - A}{A} \times 100$$

$$= \frac{63 - 70}{70} \times 100 = \frac{-7}{7} \times 10 = 10\%$$

$$110 = 3(4) + 8(6) + x$$

$$100\% = 12 + 48 + x$$

$$110 = 60 + x$$

$$110 - 60 = x$$

$$50 = x$$

$$\begin{array}{r} 500 \\ 44 \\ \hline 46 \\ 45 \cancel{5} \\ \hline 1 \end{array}$$
$$\frac{50}{110} \times 100\%$$

Lesson 4

based on salary

Base value

salary $\leq 100\%$ \rightarrow value don't given consider base value
(or) 100% as 100

eg

1) x salary rs 20,000 | the education 10%,
transport 10%,
food 25%,
bal ?

find salary

2) x salary Not given | food 10%,
10%,

- 1) Radha spends 40% of her salary on food,
 20% on house rent
 10% on entertainment
 10% on conveyance

If her savings at the end of month are Rs. 1500, then
 (in Rs) her salary per month?

type 1 $100\% - 40\% - 20\% - 10\% - 10\%$
 \underbrace{\hspace{1cm}}_{Spent}

$$100\% - 80\%$$

$$20\% = 1500$$

$$\text{So } \frac{20}{100} \times S = 100\% \text{ So } 1500 \times 5 = 7500$$

type 2 ~~$\frac{20}{100} \times S = 1500$~~
 ~~$\frac{20}{100} \times S = 2x$~~

$$2x = 1500 \times \frac{5}{4} = 7500$$

- 2) Kishan spend 30% of his salary on food

& donate 3%. & he spends Rs 2310 on these two

items. The total salary for that month is

$$33\% = 2310$$

$$100\% = x$$

$$x \times \frac{33}{77} = \frac{2310}{100} \times 100$$

$$= 7000$$

3) Mr. X spends 35% of his salary on food
of his salary on children education. In Jan.
he spent Rs 17600 on these two items. His sal-
for that month is.

$$40\% \times x = 17600$$

$$100\% = x$$

$$40 \times x = 17600 \times \frac{100}{40}$$

$$x = 44000 \text{ Rs}$$

4) Keshav spent Rs 55475 on his birthday party,
Rs 18525 on buying home appliances & the remainin
25% of total amount he had as cash with him. What was
the total amount?

$$55475 + 18525 = 84000 \quad 75\%$$

$$x \times 75 = 84000 \times \frac{100}{75}$$

$$x \times 75 = 84000 \times \frac{4}{3}$$

$$= 112000$$

$$\boxed{\text{Total} = 1,12,000 \text{ Rs}}$$

5) invest 7% of Rs. 2170 of her monthly salary in mutual fund. Later she invests 18% of her monthly salary in recurring deposit. Also she invests 6% of her salary on NSC's. What is the total annual amount invested by Ms. Sujata?

$$7\% + 18\% + 6\%$$

~~31%~~

$$\begin{array}{r} 14 \\ 217 \\ \hline 1519 \end{array}$$

$$\begin{array}{r} 1519 \\ 31 \\ \hline 4557 \\ 4557 \\ \hline 47089 \end{array}$$

$$\begin{array}{r} 7\% \\ 2170 \\ \hline 100\% \quad x \end{array}$$

$$7\% x = 2170 \times \frac{100}{100}$$

$$x = 31000 \rightarrow \text{Total salary}$$

$$100 = 31\%$$

she invests per month

$$\begin{array}{r} 100\% \quad 31000 \\ \times \quad x \\ \hline 31\% \quad x \% \end{array}$$

$$31\% = 9610$$

$$100 \times x = 31000 \times 31$$

$$x = 31000 \times 31$$

$$\boxed{x = 9610}$$

Find the total annual amount she invested
9.610 x 12 = \$115320

1,15,320 per annual

- 6) Mr. X spends 20% of his monthly income on household expenditure. Out of the remaining 25%, he spends on children's education, 15% on transport, 15% on medicine & 10% on entertainment, i.e. is.

20% + ~~20~~ 20% of 25% . $\frac{1}{4} \times 15\%$. $\{$ is $\{ 10\%$.

$$\frac{15}{50} \times \frac{4}{80} = 12$$

$$100\% = 20\% + 80\%$$

80% = 25

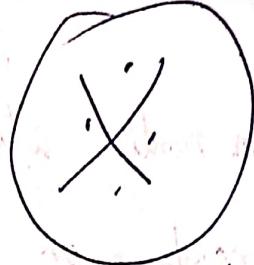
$$100 = 20 + 80$$

$$80 = \frac{20}{25} + \frac{12}{15} + \frac{12}{15} + \frac{8}{10} = 65\%$$

$$80\% \text{ } 100 = 20 + 12 + 12 + 8 = 52$$

~~65% x~~ ~~80%~~ ~~80-52~~ ~~20%~~ ~~23~~ ~~80%~~
~~80%~~ ~~20%~~ ~~9800~~ ~~x~~

$$80 \times \frac{13}{65} = 52$$



$$80 - 52 = 28 \rightarrow \text{is percentage}$$

$$28\% = 9800$$

$$100\% = x$$

out of Take 100%
done
remaining

$$28\% = \frac{9800}{x} \times 100$$

$$x = 35,000 \rightarrow \text{Total salary}$$

7) A man spends 40% of his monthly salary

on food & one third of the remaining on transport. If he saves Rs 4500 per month, which is equal to half the balance after spending on food & transport, his monthly salary is.

$$40\% \text{ of } \frac{1}{3}$$

$$40\% \cdot \frac{1}{3} = 4500$$

Take base value is 100

$$100 - 40 \rightarrow \text{food spent} = 60 \rightarrow \text{remaining}$$

$$60 \times \frac{1}{3} = 20 \rightarrow \text{for transport spent}$$

$$60 - 20 = 40$$

$$40\% = 4$$

~~(*)~~ 4500 Rs per month, which is equal to half the balance after spending on food & transport.

after spending on food & transport is 40%.

Half of food & transport is 20%.

$$20\% = 4500 \text{ Rs}$$

$$100\% = x$$

$$\begin{aligned} 20 \times x &= \frac{225}{4500} \times 100 \\ &= 22,500 \text{ Rs} \end{aligned}$$

Total salary - 22,500 Rs

- 8) A person gave 20% of his income to his elder son, 30% of the remaining to the younger son & 10% of the balance, he donated to a trust. He is left with Rs. 10080. His income was

$$100 = 80$$

$$80 = 80 - 24 = 56$$

$$56\% = 56 - 5.6$$

$$= 50.4\%$$

$$\begin{array}{r} 24 \\ \hline 80 \times 38 \\ \hline 100 \end{array}$$

$$50 \cdot 4\% = 10080$$

$$\sqrt{10 - 80}$$

100%.

$$\begin{array}{r} 504 \\ \times 2 \\ \hline 1008 \end{array}$$

$$50.4 \times x = 10080 \times 100$$

$$0.1 \times x = 20 \times 100$$

$$= 20,000 \text{ Ns}$$

9) The monthly salaries of A & B together amount to Rs. 40,000. A spends 85% of his salary & B 95% of his salary. If now their savings are the same, then the salary (in Rs.) of A is

Here, we don't have salary of A & B, so

$$\text{A} \quad x \quad \text{B} \quad (40000 - x) \quad \rightarrow \quad \begin{array}{l} \text{eg } 5000 \\ 140,000 - 5000 \\ = 135,000 \end{array}$$

other thing Saving of A - Saving of B = 30,000

$$x(100 - 85\%) = (40000 - x)(100 \cdot 95\%)$$

$$x \times \frac{15}{100} = (40000 - x) \left(\frac{5}{700} \right)$$

$$3x = \frac{40000 - x}{\textcircled{2}}$$

~~2000~~ 4000.0

$$3x + 4x = 40,000$$

$$7x = 40,000$$

$$x = 10,000$$

$$C = 10,000$$

Z.

$$A = 10,000$$

$$B = 13,000$$

$$\frac{15}{100} \times 10000 = 15000 \quad \text{Savings are same}$$

$$\frac{15}{100} \times 30000 = 15000$$

Lesson: 5

Based of voters

- 1) DMK got 5000 votes & won the election by a majority of 5000 votes
- 2) ADMK won the election by a majority of 5000 votes



Note

different
between

Majority

winner &
loser

By

Total votes

100%

The winning candidate secured 57% of the total votes polled & won by a majority of 42,000.

Q6 Total number of votes polled is.

Winning	lossing
57%	43%

$$57 - 43\% = 14\%$$

~~$$14\% = 42000$$~~

~~$$\frac{14}{100} = \frac{42000}{x}$$~~

~~$$x \times 14 = 42000 \times 100$$~~

~~$$= 3,00,000 \text{ votes}$$~~

2) In a election, a candidate secured 40% of the votes but is defeated by the only other candidate (by a majority) of 298 votes. Find the total number of votes recorded.

losser	winner
40%	60%

$$x \times \frac{20}{100} = 298 \times 100$$

$$= 1490$$

$$40\% \approx 60\% = 20\%$$

$$x = 1,490$$

$$20 = 298$$

$$100\% = x$$

3) In a election b/w two candidates, one get 72% of the total votes. If the total votes are 8200 by majority how many votes did the winner win the election?

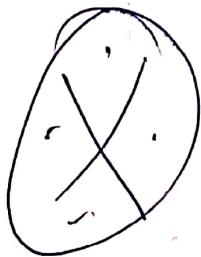
$$72\% = x$$

$$100\% = 8200$$

$$\begin{array}{r} 72 \\ 82 \\ \hline 144 \\ 576 \\ \hline 5904 \end{array}$$

$$72 \times 8200 = 5904$$

$$x = 5904 \text{ votes}$$



$$\begin{matrix} w & l \\ 72\% & 28\% \end{matrix}$$

$$72 - 28 = 44\%$$

$$\text{different by, } 100\% = 8200$$

by how many votes?

$$100\% = 8200$$

$$\begin{array}{r} 82 \\ 44 \\ \hline 328 \end{array}$$

$$44\% = x$$

$$\begin{array}{r} 328 \\ \hline 2608 \end{array}$$

$$x \times 100 = 8200 \times 44$$

$$x = 3608$$

4) In an election b/w two candidate getting 60% of the vote polled is elected by a majority of 14,000 votes. The number of votes polled by the winning candidate is.

$$60\% - 40\%$$

$$20\% = 14,000$$

$$100\% = x$$

$$20 \times 14,000 = \frac{1}{100} \times 60$$

$$= 42,000 \text{ votes}$$

5) In an election, three candidates contested. The first candidate got 40% votes & the second got 36% votes.

If the total number of votes polled were 36,000, find the number of votes got by the third candidate.

$$100 - 76 = 24\% \quad (\text{Q1})$$

$$24\% = x$$

$$100\% = 36,000$$

$$24 \times 36,000 = 100x$$

$$= 8640$$

$$8640 \rightarrow \text{the}$$

$$40\% + 36\% + x = 100\% \quad [100 - 76]$$

$$100\% = 286400$$

$$27360$$

$$\underline{8640}$$

$$7636\overline{76}$$

$$\overline{36}$$

$$\overline{456}$$

$$\overline{228}$$

$$\overline{27360}$$

$$\overline{21}$$

$$\overline{36}$$

$$\overline{24}$$

$$\overline{144}$$

$$\overline{72}$$

$$\overline{8640}$$

Based on invalid votes

- 1) In a college election between two candidates 10% of the vote cast are invalid. The winner gets 70% of the valid votes & defeats the loser by 1800 votes. How many votes were totally cast?

(X)

Here from valid votes $\frac{70}{100} \times 100 = 70\%$ was $70\% + 30\% = 100\%$

~~from 90% of votes 70% & 30%~~

take $90\% \Rightarrow 70\%$

\downarrow $100\% \quad 63\% \quad 27\%$

$63\% - 27\% = 36\%$

$$36 = 1800$$

$$100 = x$$

$$\frac{x}{36} \times 100 = \frac{1800}{36} \times 100 = 5000$$

5000

7) 9% of the voters in an election did not cast their votes. In the election, there were only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1100 votes. The total number of votes in the election was.

$$100\% - 9\% = 91\%$$

(*) Total votes is 91%.
Here from total votes

$$91\% - 48\% = 43\%$$

$$43\% - 24\% = 19\%$$

$$19\% = 1100 \text{ votes}$$

$$100\% = x$$

$$\begin{array}{r} 275 \\ 4 \sqrt{1100} \\ \underline{-8} \\ 30 \\ \underline{-28} \\ 20 \end{array}$$

$$x = \frac{275}{100} \times 100 = 27500 \text{ votes}$$

8) In an assembly election a candidate got 55% of the total valid votes. ^{2% of total votes} were declared invalid. If the total number of voters is 104000, then the number of valid votes polled in favour of the candidate

$$100\% - 2\% = 98\% \quad \frac{98 \times 55}{100}$$

from total valid votes

$$98\% = 55\% \quad 45\% \quad \frac{45 \times 98}{100}$$

$$= 53.9\%$$

$$10\% = 10400$$

$$\begin{array}{r} 137 \\ 539 \xrightarrow{\times 10} \\ 539 \\ \hline 2158 \end{array}$$

$$x = 539 \times 1040$$

$$\begin{array}{r} 539 \\ \hline 56056 \end{array}$$

$$\boxed{x = 56056.0}$$