

# Welcome to the World of Online Coaching by



Today's Topic

## Percentage

# Topics to be covered

- ✓ Definition & Basics
- ✓ Fraction to % and % to fractions
- ✓ Applications
- ✓ % change
- ✓ Successive % change
- ✓ Practice examples

# Percentage Basics

- How it was named?

Per     cent  
/         100

- Why it was invented?

-Harsh 60 marks / total 70 ,

-Rohan 70 marks / total 80    Then Who will get this? →



- base is not common
- what if we make base common, lets say the both the exam was of 350 marks then..???
- As we all know the easiest base will be 100.

For Harsh 70 - 60    →  $60 \times 100 / 70 = 85.7$  / 100 or %  
100 - ?

For Rohan 80 - 70    →  $70 \times 100 / 80 = 87.5$  / 100 or %  
100 - ?

# Percentage Definition

- Definition?

1. What is 40% of 90?

2. What % of 60 is 45?

3. 28 is 40% of what?

$$\begin{array}{ccccccc} \text{What} & \text{is} & 40 & \% & \text{of} & 90 & ? \\ X & = & 40 & / 100 & * & 90 & \end{array}$$

Similarly , What % of 60 is 45?

$$x / 100 * 60 = 45 \rightarrow x = 45 * 100 / 60 \rightarrow 75\%$$

Similarly , 28 is 40% of what?

$$28 = 40 / 100 * x \rightarrow x = 28 * 100 / 40 \rightarrow 70$$

# Percentage practice questions

- Questions:

1. What is 60% of 120? →
2. What % of 90 is 54? →
3. What % of 1200 is 36? →
4. 56 is 40% of what? →
5. 37.5% of what is 90? →
6. What is 20% of 50% of 80% of 25250? →
7. What % of  $\frac{900}{Y^2}$  is  $\frac{3X^2Y}{10}$  ?

# Percentage practice questions

- Answers:

1. What is 60% of 120? → Ans: 72
2. What % of 90 is 54? → Ans: 60%
3. What % of 1200 is 36? → Ans: 3%
4. 56 is 40% of what? → Ans: 140
5. 37.5% of what is 90? → Ans: 240
6. What is 20% of 50% of 80% of 25250? → Ans: 2020
7. What % of  $\frac{900}{Y^2}$  is  $\frac{3X^2Y}{10}$  ?

as per our definition :  $\frac{K}{100} * \frac{900}{Y^2} = \frac{3X^2Y}{10} \rightarrow \text{Ans: } K = \frac{x^2y^3}{30}$

# Fraction $\leftrightarrow$ Percentage Equivalent

For going from fraction to Percentage

$$\text{Fraction} * 100 = \text{Percentage}$$

& going from Percentage to Fraction

$$\text{Percentage}/100 = \text{Fraction}$$

Fraction	Percentage	Fraction	Percentage
1	100 %	1/9	11.11 %
1/2	50 %	1/10	10 %
1/3	33.33 %	1/11	9.09 %
1/4	25 %	1/12	8.33 %
1/5	20 %	1/13	7.69 %
1/6	16.66 %	1/14	7.14 %
1/7	14.28%	1/15	6.66 %
1/8	12.5 %		

How it is useful?

33.33% of 99 = ?  $33.33/100*99$  = Too time consuming

But 1/3 of 99 = Ans: 33

# Practice of Fraction $\leftrightarrow$ Percentage Equivalent

- 25 % of 96
- 12.5 % of 112
- 9.09 % of 286
- 7.14 % of 1960
- 66.66 % of 561
- 75% of 124
- 28.56% of 49
- 87.5% of 160
- 116.66 % of 48

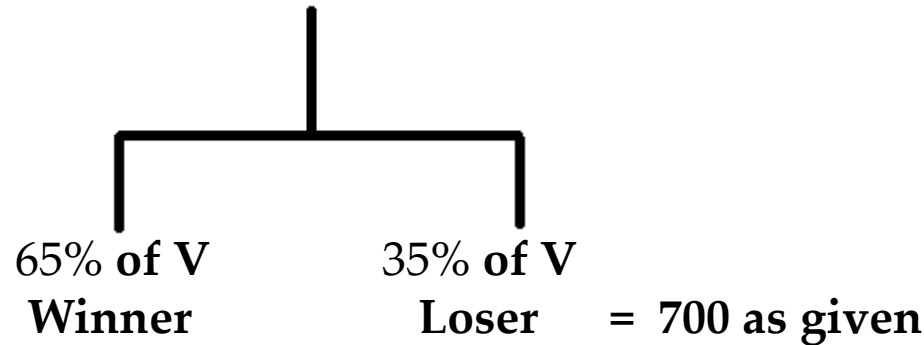


# Practice of Fraction $\leftrightarrow$ Percentage Equivalent

- 25 % of 96  $\rightarrow \frac{1}{4} * 96 = 24$
- 12.5 % of 112  $\rightarrow \frac{1}{8} * 112 = 14$
- 9.09 % of 286  $\rightarrow \frac{1}{11} * 286 = 26$
- 7.14 % of 1960  $\rightarrow \frac{1}{14} * 1960 = 140$
- 66.66 % of 561  $\rightarrow \frac{2}{3} * 561 = 374$
- 75% of 124  $\rightarrow \frac{3}{4} * 124 = 93$
- 28.56% of 49  $\rightarrow \frac{2}{7} * 49 = 14$
- 87.5% of 160  $\rightarrow \frac{7}{8} * 160 = 140$
- 116.66 % of 48  $\rightarrow 1 + \frac{1}{6} = \frac{7}{6} * 48 = 56$

# Applications of percentage: Elections

- **Que:** In an election between two candidates winner got 65 % of the total votes casted and Loser got 700 votes how many votes did winner get?
- **Solution:** suppose total votes casted were  $V$   
Total  $V$  votes



So  $35/100$  of  $v = 700 \rightarrow v = 2000$

And now total – loser = winner so  $2000 - 700 = \text{Ans: } 1300 \text{ votes}$

- Now, here as base is common (i.e.  $V$ ), we can directly find by unitary method

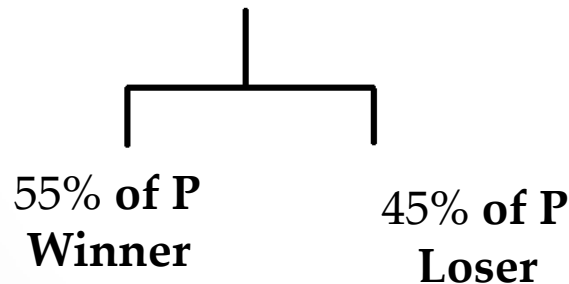
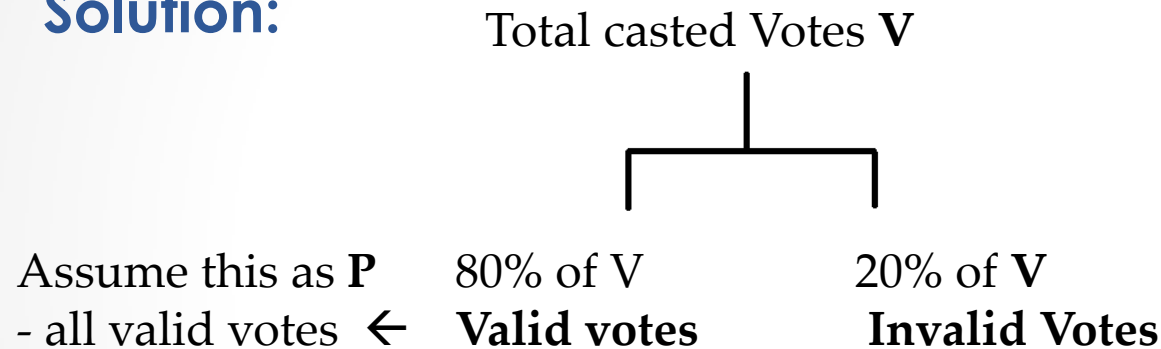
$$\begin{array}{rcl} 35 & - & 700 \\ 65 & - & ? \end{array} \rightarrow \text{so Ans: } 1300 \text{ votes}$$

**\*\* This we can do only because base of 35% and 65% is common( $V$ )**

# Applications of percentage: Elections

- **Que:** In an election between two candidates 20 percentage of the total votes casted were invalid, winner got 55 percentage of the valid votes & loser lost by 120 votes. how many people casted votes?

- **Solution:**



So now as given,  
Loser lost by 120 votes so  
Difference between winner and  
loser was 120 votes  
So  $0.55P - 0.45P = 120$ , solving  
 $P = 1200$

And as assumed

$80\%$  of  $V = P$

$\rightarrow 0.8 V = 1200$ , **Ans:  $V = 1500$**

Short cut:

$$55-45 = 10\% \text{ of } P = 120$$

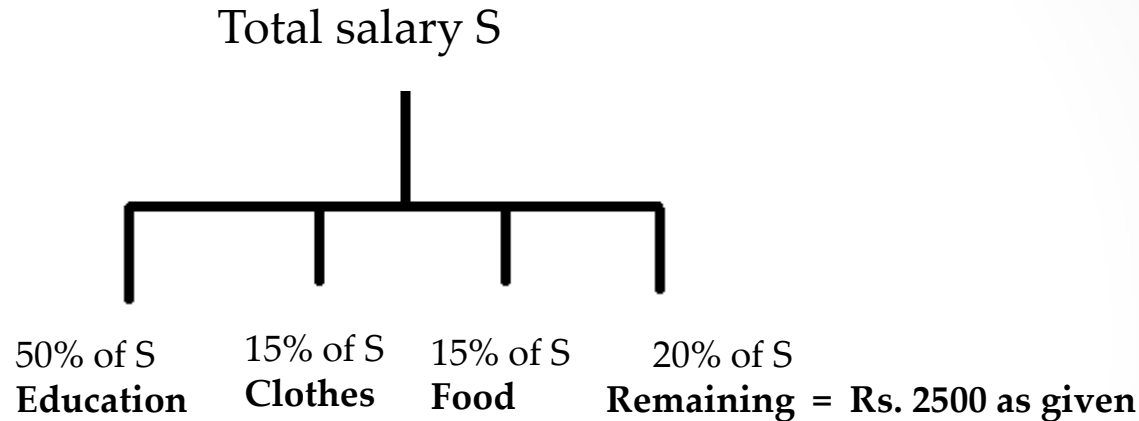
$$\text{So } P = 1200 \text{ and } \frac{4}{5} * V = 1200$$

$$\text{So } V = 1200 * \frac{5}{4} = \text{Ans: } 1500$$

# Applications of percentage: Salary

- **Que:** A man spends his salary 50 percentage on education 15 percentage on cloth 15 percentage on Food and remaining is his Saving which is 2500 rupees then what is his salary?

- **Solution:**



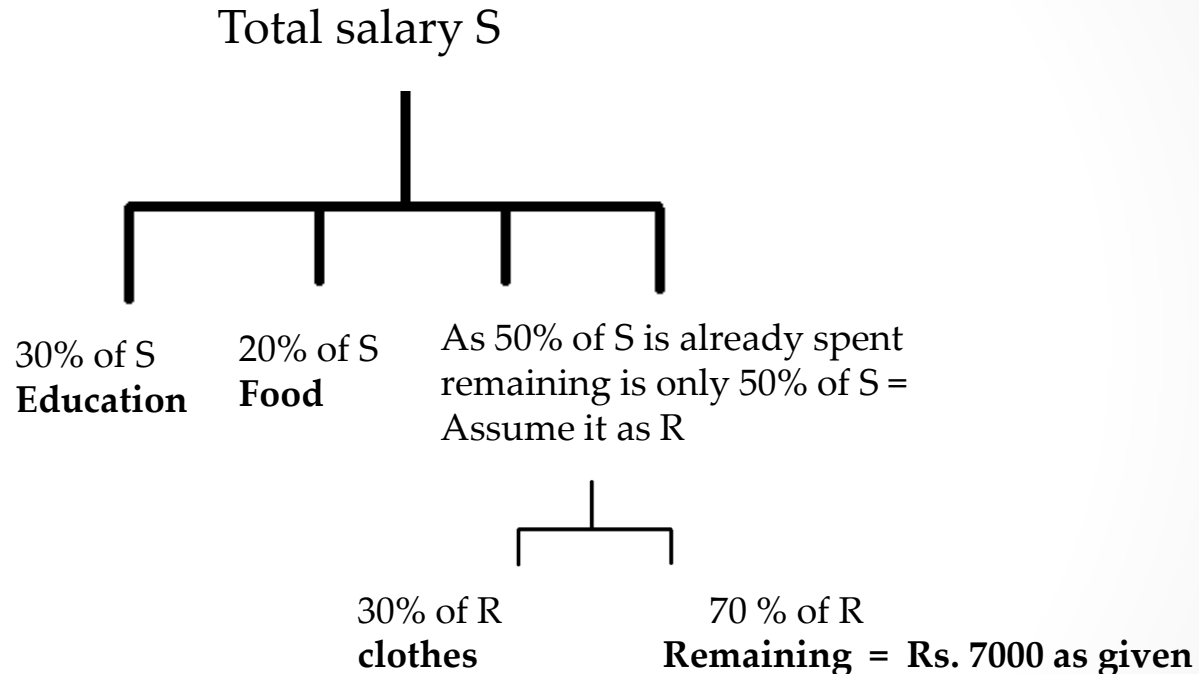
**So,  $20/100$  of  $S = 2500$**

**$\rightarrow S = \text{Ans: Rs } 12500/-$**

# Applications of percentage: Salary

- **Que:** A person spends his salary 30 percentage on education 20 percentage on food & 30 percentage of the remaining on clothes and rest is his savings which is 7000 rupees find his salary

- **Solution:**



$$70/100 \text{ of } R = 2500 \rightarrow R = \text{Rs. } 10000/-$$

Now, As we know 50% of  $S = R$ , so

$$\rightarrow S = \text{Ans: Rs. } 20000/-$$

# Applications of percentage: Salary

- **Que:** A's income is 70% of B's income, B's income is Half of C's income, and C's income is 20% of D's income. If A's income is Rs. 35000/- then what is D's income?

- **Solution:**

$$A = 0.7B$$

$$B = \frac{1}{2} C$$

$$C = 0.2 D$$

$$\text{As given } A = 35000 \rightarrow 35000 = 0.7 B$$

$$\rightarrow 35000 = 0.7 * \frac{1}{2} C$$

$$\rightarrow 35000 = 0.7 * \frac{1}{2} * 0.2 * D$$

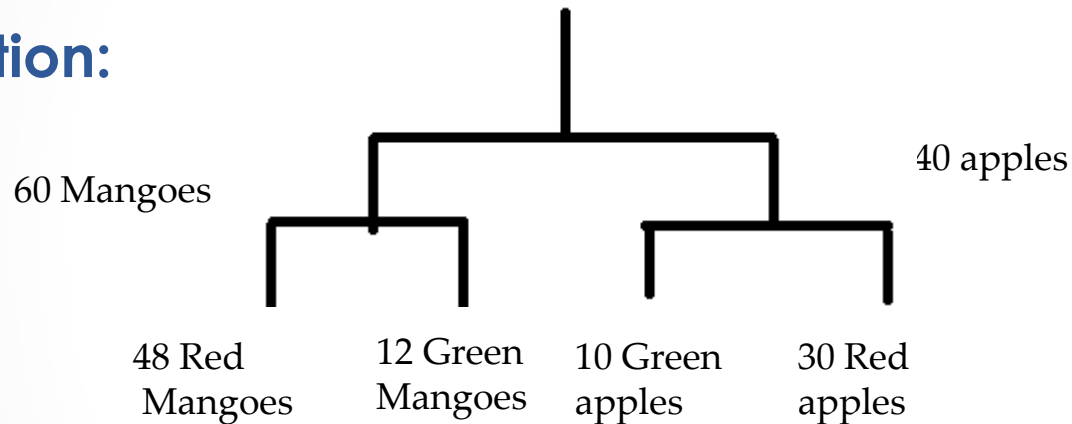
$$\rightarrow D = \frac{35000}{0.7 * \frac{1}{2} * 0.2} = \text{Ans: Rs. 5,00,000/-}$$

# Applications of percentage: Misc

- **Que:** In a Basket 60% are mangoes in rest are Apples. 25% of the apples are green and rest are red. 80% of the mangoes are red and rest are green. What percentage of green fruits are mangoes?

Suppose Total  
Fruits 100

- **Solution:**



What % of green fruits are mangoes?

$$x / 100 * 22 = 12$$

$$\rightarrow X = 12 * 100 / 22 = 54.54\%$$

$$\rightarrow \text{Ans : } 54.54\%$$

# Applications of percentage: Misc

- **Que:** If A's salary is 80% of B's salary then B's salary is what % of A's salary?

- **Solution:**

Type 1: assume B's salary is 100 , so A's salary as given is 80

Question is → B's salary is What % of A's salary ?

As per definition →  $100 = x / 100 * 80 \rightarrow \text{Ans: } 125\%$

Type 2: As given A's salary is 80% of B's salary

$$A = 80/100 * B \text{ or } A = \frac{4}{5} B$$

thus we can also say  $B = 100/80 * A$  or  $B = \frac{5}{4} A$  , which

theoretically represent B is 125% (from 5/4) of A

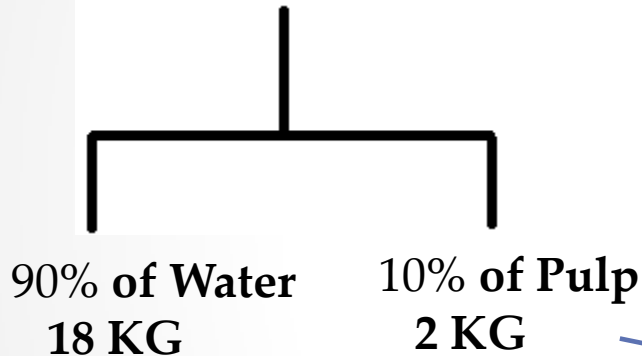


# Applications of percentage: Misc

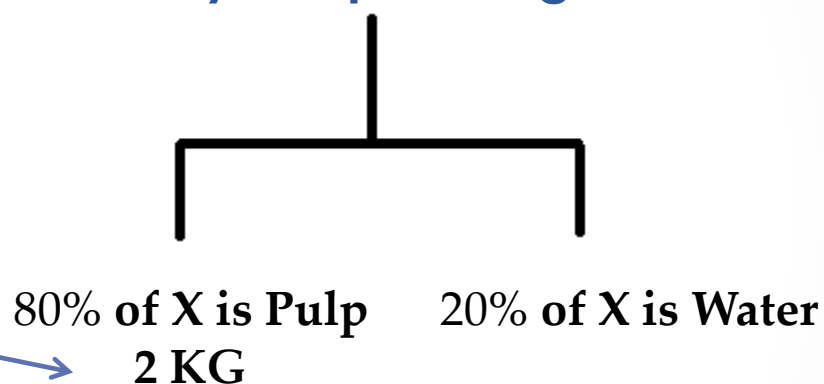
- **Que :** Fresh Grapes contain 90% water, while dry grapes contain 20% water, what will be the weight of dry grapes available from 20 KG of fresh grapes?

- **Solution:**

**Fresh Grapes 20 KG**















**Dry Grapes X kgs**



So as given  $80/100$  of  $X = 2 \text{ kg} \rightarrow X = 2.5 \text{ Kgs}$

So we can obtain 2.5 Kg of dry grapes from 20 KG of Fresh grapes

## Percentage Change: % increase, % decrease, % More, % Less.

- $80 \rightarrow 100$  - 20%    $\rightarrow \text{Change/Initial Value} \rightarrow 20/80 * 100 = 25\%$  
- $120 \rightarrow 100$  - 20%    $\rightarrow \text{Change/Initial Value} \rightarrow 20/120 * 100 = 16.66\%$  
- $100 \rightarrow 120$  - 20%    $\rightarrow \text{Change/Initial Value} \rightarrow 20/100 * 100 = 20\%$  
- $140 \rightarrow 120$  - 20%    $\rightarrow \text{Change/Initial Value} \rightarrow 20/140 * 100 = 14.28\%$  

$$\begin{aligned}\% \text{ change Formula} &= \frac{\text{Final value} - \text{Initial Value}}{\text{Initial value}} * 100 \% \\ &= \frac{\text{Change in value}}{\text{Initial value}} * 100 \%\end{aligned}$$

**\*\*Very Important Formula and most important thing to remember is there will be Initial value in the denominator to find percentage change.**

# Quick Practice of % change

Initial Value - Final Value

300 → 500

90 → 120

200 → 150

9 → 90

1 → 4

0.7 → 7

500 → 510

4 → 0

0 → 4

**Find % change.**

# Quick Practice of % change answers

IV - FV

$$300 \rightarrow 500 \rightarrow 200/300 * 100 = 66.66\%$$

$$90 \rightarrow 120 \rightarrow 30/90 * 100 = 33.33\%$$

$$200 \rightarrow 150 \rightarrow 50/200 * 100 = 25\%$$

$$9 \rightarrow 90 \rightarrow 81/9 * 100 = 900\%$$

$$1 \rightarrow 4 \rightarrow 3/1 * 100 = 300\%$$

$$0.7 \rightarrow 7 \rightarrow 6.3 / 0.7 * 100 = 900\%$$

$$500 \rightarrow 510 \rightarrow 10/500 * 100 = 2\%$$

$$4 \rightarrow 0 \rightarrow 4/4 * 100 = 100\%$$

$$0 \rightarrow 4 \rightarrow 4/0 * 100 = \text{Not defined (infinite)}$$

**So, this concept and formula can be used where we are given or we have derived or assumed the Initial value and Final value. That means if we have both of these values then we can use this formula.**

**But What if we are given Either of these two values along with percentage change and asked to find the remaining one?**

# Multiplication factor concept

**Que: Dhoni scored 80 runs in first innings of the match but in second innings he score 30% more runs than first innings, find his score in second innings ?**

**Solution: we are given initial value = 80 Runs and % increase of 30%.  
So by formula  $(F.V - I.V)/I.V * 100$  % it will be Will be little lengthy.**

**We can do,  $80 + \frac{30}{100} * 80 = 80 + 24 = \text{Ans: 104 Runs}$**

**Que: Dhoni scored 120 runs in first innings of the match but in second innings he score 60% less runs than first innings, find his score in second innings ?**

**Solution: we are given initial value = 120 Runs and % decrease of 60%.**

**So again formula  $(F.V - I.V)/I.V * 100$  % it will be Will be little lengthy.**

**We can do,  $120 + \frac{60}{100} * 120 = 120 - 72 = \text{Ans: 48 Runs}$**

# Multiplication factor concept

**Que:** Dhoni scored 126 runs in Second innings of the match which was 40% more than first innings score, find his score in First innings ?

**Solution:**

we are given Final value = 126 Runs and % increase of 40%.

So by formula  $(F.V - I.V)/I.V * 100 \%$  it will be Will be little lengthy.

So, Can we do,  $126 - \frac{40}{100} * 126 = 126 - 50.4 = \text{Ans: } 75.6 \text{ Runs??}$  ❌ 🤔

Why it is wrong? → because we found the 40% of final value which is wrong as per given information. we need to find 40% of initial value.

But we are not given initial value here, so assume as X

$X + \frac{40}{100} * X = 126 \rightarrow \text{Solving for } X = \text{Ans: } 90 \text{ Runs.}$  ✓

**What is Multiplication Factor and How it will be useful?**

# Multiplication factor concept

In Que 1 **we are given initial value = 80 Runs and % increase of 30%.**

So basically can we simply say we have to increase the initial value by 30% or in other words **we need to find 130% of initial value !!**

That we can do by  $\frac{130}{100} * 80 = \text{Ans: } 104$

This is called **M**ultiplication **F**actor

So if we need to increase a value then MF will be **(100 + X)/100 %**

& if we need to decrease a value then MF will be **(100 - X)/100 %**

So , equation we need to remember is **Initial Value \* (M.F) = Final value**

In Que 2 we are given Initial value = 120 and % Decrease of 60%

So as per formula ,  $IV \left( \frac{100-60}{100} \right) = FV \rightarrow 120 * ( 0.4 ) = \text{Ans: } 48$

In Que 3 **we are given Final value = 126 Runs and % Increase of 40%**

so as per formula  $I.V * M.F = F.V \rightarrow I.V = \frac{F.V}{M.F}$

$$X = \frac{126}{1.4} \rightarrow \text{Ans } X = 90$$

# Quick Practice Multiplication factor

Initial Value	Final value	% Change
3000	??	60% Increase
800	??	20% Decrease
??	37500	25% increase
??	1100	45% decrease
700	??	5% increase
??	8.5	95% decrease



# Quick Practice Multiplication factor

Initial Value	Final value	% Change	Multiplication factor	Answer
3000	??	60% Increase	3000 (1.6)	4800
800	??	20% Decrease	800 (0.8)	640
??	37500	25% increase	37500/(1.25)	30000
??	1100	45% decrease	1100/(0.55)	2000
700	??	5% increase	700(1.05)	735
??	8.5	95% decrease	8.5/(0.05)	170

# Summary & Important understanding of % and MF

Theoretical Statement	Mathematical Understanding
A is 20% of B	$A = 0.2 B$
A is 20% more than B	$A = 1.2 B$
A is 30 % less than B	$A = 0.7 B$
A is increased by 40% to get B	$A * 1.4 = B$
A is decreased by 30% to get B	$A * 0.7 = B$

Mathematical Statement	Theoretical Understanding
$A = 0.2 B$	A is 20% of B or A is 80% less than B
$A = 1.2 B$	A is 120% of B or A is 20% more than B

# Practice Exmaples

- **Que:** A got 10% less marks than B. B got 25% marks more than C. C got 20% less than D. A hot 360 marks out of 500. then find what percentage of marks D got?

**Options:**      A. 70                      B. 75                      C. 82                      D. 80

- **Solution:**

$$A = 0.9B$$

$$B = 1.25 C$$

$$C = 0.8 D$$

$$\text{So } 360 = 0.9 * 1.25 * 0.8 D \rightarrow D = \frac{360}{0.9 * 1.25 * 0.8} \rightarrow D = 400$$

$$\text{Percentage} \rightarrow 400/500*100 = \text{Ans: } 80\%$$

# Practice Exmaples

- **Que:** A student scored 50% of maximum marks in an exam and yet failed by 12 marks. If he would have scored 10% more than what he scored then he would have just managed to get pass percentage. Find maximum marks of Exam.

**Options:** A. 500      B. 240      C. 120      D. 360

- **Solution:**

Suppose maximum marks is  $M$  then,

Student scored  $0.5 * M$  and yet failed by 12 marks so,

$$0.5 * M + 12 = \text{Passing marks} \text{ ----- EQ.1}$$

Now 10% more than what he scored is also exact passing marks so,

$$1.1 * 0.5 * M = \text{Passing marks so -----EQ. 2}$$

From both Equations

$$0.5M + 12 = 1.1 * 0.5M \rightarrow \text{Ans: } M = 240$$

# Practice Exmaples

**Que:** If A's salary is 50% more than B's salary then by what percentage B's salary is less than A's salary?

**Solution:**

Suppose B's salary is 100 then A's salary will be as 150 as given.

Now focus on question, We are asked Percentage less so,

Formula is  $\frac{F.V - I.V}{I.V} * 100 \rightarrow \frac{\text{change}}{IV} * 100 \rightarrow \frac{50}{\text{Initial value}} * 100$

Now here Initial value is to be taken carefully. See question.

By what % B's salary is Less **than** A's salary. ← initial value

So  $\frac{50}{150} * 100 = \text{Ans: } 33.33\%$

**Short Cut:**

**% less =  $\frac{R}{100 + R} * 100 \%$  and % more =  $\frac{R}{100 - R} * 100 \%$**

**Here we need % less so,  $\frac{50}{100+50} * 100 = \text{Ans: } 33.33\%$**

# Practice Exmaples

Similar Que: If A scored 20% less than B, then by what percentage B scored more than A?

**Solution:**

Suppose B scored 100 then A scored 80 as given.

Now focus on question, We are asked Percentage more so,

Formula is  $\frac{F.V - I.V}{I.V} * 100 \rightarrow \frac{\text{change}}{IV} * 100 \rightarrow \frac{20}{\text{Initial value}} * 100$

Now here Initial value is to be taken carefully. See question.

By what % B scored more **than**   $\leftarrow$  initial value

So  $\frac{20}{80} * 100 = \text{Ans: } 25\%$

**Short Cut:**

**% less =  $\frac{R}{100 + R} * 100 \%$  and % more =  $\frac{R}{100 - R} * 100 \%$**

**Here we need % more so,  $\frac{20}{100 - 20} * 100 = \text{Ans: } 25\%$**

# Practice Exmaples

**Que: If Price of commodity is increased by 20% then by what % consumption must be reduced to keep expenditure same?**

**Solution:**

First we need to understand the relation between Price, consumption and Expenditure.

$$\text{Expenditure} = \text{Price} * \text{Consumption}$$

For Ex: If price of petrol is Rs 50/ ltr and I consume 2 litres monthly then my Expenditure is  $100 = 50 * 2$  (Exp = P \* C)

Now assume the price and consumption before any increase

Case 1:(Before Increase)  $\rightarrow P = 100$  &  $C = 100$ , then  $\text{Exp} = 100*100$

Case 2: (after Increase)  $\rightarrow P = 120$ (due to 20% increase),  $C = ??$  If expenditure is to be kept same then  $\text{Exp} = 100*100$

$$\text{Then } 100*100 = 120 * X \rightarrow X = \frac{100 * 100}{120} = 83.33.$$

As we assumed Consumption to be 100 initially, now it has reduced to 83.33 which is **Ans: 16.66% of reduction.**

**Short Cut:**

$$\% \text{ less} = \frac{R}{100 + R} * 100 \% \quad \text{and} \quad \% \text{ more} = \frac{R}{100 - R} * 100 \%$$

Here we need % less so,  $\frac{20}{100+20} * 100 = \text{Ans: } 16.66\%$

# Practice Exmaples

**Similar Que: If length of a rectangle decreased by 10% then by what % width must be increased not to change the area?**

**Solution:**

$$\text{Area} = L * W$$

Now assume L & W before any change

Case 1:(Before change)  $\rightarrow L = 100$  &  $W = 100$ , then  $\text{Area} = 100*100$

Case 2: (after decrease)  $\rightarrow L = 90$ (due to 10% decrease),  $W = ??$  If expenditure is to be kept same then  $\text{Exp} = 100*100$

$$\text{Then } 100*100 = 90 * X \rightarrow X = \frac{100 * 100}{90} = 111.11$$

As we assumed it to be 100 initially now it has increased to 111.11 which is  
**Ans: 11.11% of increase.**

**Short Cut:**

$$\% \text{ less} = \frac{R}{100 + R} * 100 \% \quad \text{and} \quad \% \text{ more} = \frac{R}{100 - R} * 100 \%$$

$$\text{Here we need \% more so, } \frac{10}{100-10} * 100 = \text{Ans: 11.11\%}$$



# Summary of last few similar questions

❑ We have done 4 such questions & all those Question can be directly done form, Fraction → percentage table. Compare.

→ 50 less 33.33% , 20 more 25% , 20 less 16.66% , 10 more 11.11%

→ Any Relation of the form  $Z = X * Y$  can be solved that way, Why?

→ Take example of  $\text{Area} = \text{Length} * \text{width}$

Assume  $1A = 1L * 1W$

Now if the length is decreased by 25% then  $1L$  becomes  $(1 - \frac{1}{4}) L = \frac{3}{4} L$

But Area is to be kept  $1A$  only so,

$1A = \frac{3}{4} L * \frac{4}{3} \underline{?} W$  definitely we will have to put  $\frac{4}{3}$  as coefficient of  $W$ , so  $A$  remains  $1A$ .

→ Now, we assumed  $W$  as  $1W$  which now we've to take as  $\frac{4}{3} W$ . so that's a increase of  $\frac{1}{3} W$  which indicates 33.33%.

→ This we can apply to all those equations where one variable is result of product of two variables. Like

→ 1.  $\text{Area} = L * B$  2.  $\text{Dist} = \text{Speed} * \text{Time}$  3.  $\text{Exp} = \text{Price} * \text{Consumption}$  etc.

# Successive % change

Ex: Sachin, Virat and pruthvi works in a company and has same salary as Rs. 20000. looking at their performances

- ✓ Sachin → 40% increment
- ✓ Virat → 20% increment and again 20%
- ✓ Pruthvi → 10% increment and again 10% and again 10% and again 10%

Find salaries of all three of them after all increments, also % increase in Virat's and Pruthvi's salaries.

**Solution:**

**Salaries:**

$$\text{Sachin} \rightarrow 20000 * 1.4 = 28000/-$$

$$\text{Virat} \rightarrow 20000 * 1.2 * 1.2 = 20000 * 1.44 = 28800/-$$

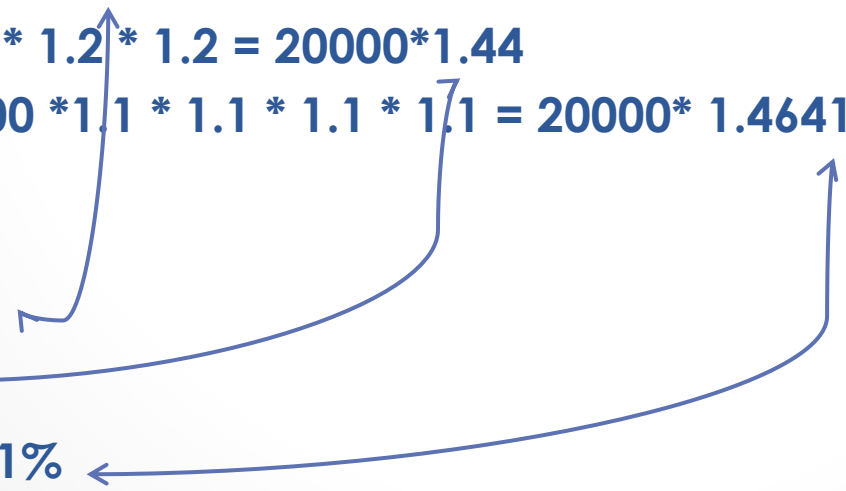
$$\text{Pruthvi} \rightarrow 20000 * 1.1 * 1.1 * 1.1 * 1.1 = 20000 * 1.4641 = 29282/-$$

**% changes:**

Sachin → 40%

Virat → 44%

Pruthvi → 46.41%



# Practice Example Successive % change

Successive % Change formula: (For two successive changes)

$\% \text{ change} = \pm A \pm B \pm \frac{AB}{100}$  Eg: Virat in previous example:  $+20+20+\frac{20*20}{100} = 44\%$

**Que:** Petrol price in two states A & B is same Rs 50/litre, now State A reduces it by 20%, but State B reduces it successively two times by 10% and again 10%. Find final prices in both states and also % change in State B.

**Solution:**

State A  $\rightarrow 50 * 0.8 = \text{Rs } 40/-$

State B  $\rightarrow 50 * 0.9 * 0.9 = 50 * 0.81 = 40.5/-$

% change in State B: 19% 

Also from above equation

$$-10 -10 + \frac{10 * 10}{100} = -19\%$$

# Practice Examples

**Que:** A truck Travelling at 70 Kmph uses 30% more diesel to travel certain distance than it does at 50 kmph. If truck can travel for 19.5 km in one litre at speed of 50 Kmph then how far truck can travel on 10 Litres of petrol at speed of 70 kmph?

**Solution:**

30% more diesel @ 70 kmph than 50 kmph means

Diesel used at 50 kmph is 1 litre for some distance then

Diesel used at 70 kmph is 1.3 litre for the same distance.

So as given truck can travel 19.5 km on 1 litre at 50 kmph then,  
truck can travel 19.5 km on 1.3 litre at 70 kmph then,

Also we are asked for 10 litre so simple,

1.3 litre → 19.5 km

10 litres → ??

**Ans = 150 KM**

# Practice Examples

**Que:** A shepherd has “m” numbers of sheep at beginning of year 2000. The number grow by  $x\%$  in year 2000. But in 2001 due to some epidemic among sheep many of them die and decreased by  $y\%$ . At the beginning of year 2002 shepherd observes that he has “m” sheep. Then,

**Option:** A.  $x > y$

B.  $x < y$

C.  $x = y$

D. can't be determined

**Solution:**

suppose 100 sheep then  $\longrightarrow$  20% increase  $\longrightarrow$  120 Sheep now,

120 if decreased by same % (by which 100 was increased) then we will never end at 100 sheep once again it will be 96 sheep only. So that means % increase will always be greater than % decreased if we ended at same value “m” sheep.

Hence **Ans:  $x > y$**

# Practice Examples

**Que:** In an election involving republicans and Democrats only, the number of votes against the republicans increased by 25% over previous election and they lost by margin twice as large as that by which it had won the previous election. If a total number of 2,60,000 people voted each time, how many people voted for democrats in previous election?

**Options:** A. 1,10,000      B. 1,40,000      C. 1,60,000      D. 1,20,000

**Solution:**

Year	Republicans	Democrats	Margin
Previous Year	$2,60,000 - 100X$	$100X$ (assumed)	M
This Year	$2,60,000 - 125X$	$125X$	2M

$$2[(2,60,000 - 100X) - 100X] = 125X - (2,60,000 - 125X)$$

**Solving  $X = 1200 \rightarrow$  Votes for Democrats Previous Year =  $100X$  so,**

**Ans =  $100 * 1200 = 1,20,000$ .**

# Doubts?



- Do you particularly require revision of any topic ?
- Did you not understand any particular example?
- Or any thing else?
- Feel free to ask.