# Tricks to solve Percentage Problems

Percentage is a fraction whose denominator is always 100. x percentage is represented by x%.

## To express x% as a fraction :

We know

$x\% = {}^x/100$

Thus $10\% = {}^{10}/100$ (means 10 parts out of 100 parts)

$= {}^1/10$ (means 1 part out of 10 parts)

## To express x/y as a percentage :

We know that ${}^x/y = ({}^x/y \times 100)$

Thus ${}^1/4 = ({}^1/4 \times 100)\% = 25\%$

and $0.8 = ({}^8/10 \times 100)\% = 80\%$

## If the price of a commodity increases by R%, then reduction in consumption as not to increase the expenditure is-

$[{}^R/_{(100+R)} \times 100]\%$

## If the price of a commodity decreases by R%, then the increase in consumption as not to decrease the expenditure is -

$[{}^R/_{(100-R)} \times 100]\%$

## Result on Population :

Let the population of a town be P now and suppose increases the rate of R% per annum, then :

1. Population after n years = $P\left(1+\frac{R}{100}\right)^n$
2. Population n years ago = $\frac{P}{\left(1+\frac{R}{100}\right)^n}$

## Result on Depreciation :

Let the present value of a machine be P. Suppose depreciates at the rate of R% per annum Then :

**1.** Value of the machine after n Years

= $P\left(1-\frac{R}{100}\right)^n$

**2.** Value of the machine n years ago

= $\frac{P}{\left(1-\frac{R}{100}\right)^n}$

- If A is R% more than B, then B is less than A by

$\left[\frac{R}{(100+R)}\times100\right]\%$

If A is R% less than B, then B is more than A by

$\left[\frac{R}{(100-R)}\times100\right]\%$
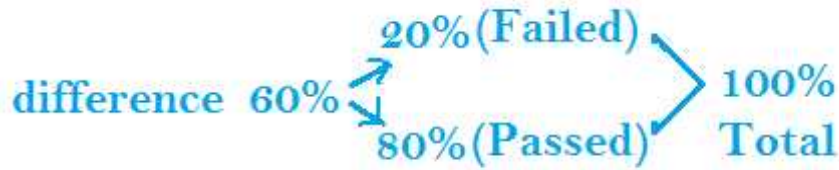
- Net % change = $x + y + xy/100$

## Some Observation

### #1

If 20% candidate failed in an exam then observations are

- 80% represent passed in exam

- 100% represent total appeared in exam

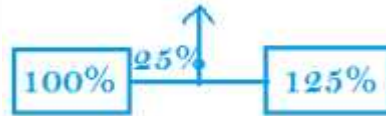- (80%-20%) = 60% represent difference between passed and failed candidate in exam

## #2

If a number is increased by 25% then observations are

- 100% represent the old number

- 125% represent the new number.



## #3

Remember that Base in the given sentence (Question) is always 100%

Eg. Income of Ram is increased by 20%

In this sentence

100% - represent the income of Ram

20% - represent increment

120% - represent new income of Ram.

## Remember it :

1 = 100%

1/2 = 50%

1/3 = 33 1/3%

1/4 = 25%

1/5 = 20%

1/6 = $16^2/3\%$

1/7 = $14^2/7\%$

1/8 = $12^1/2\%$

1/9 = $11^1/3\%$

1/10 = 10%

1/11 = $9^1/11$%

1/10 = $8^1/3$%

1/13% = $7^9/13$%
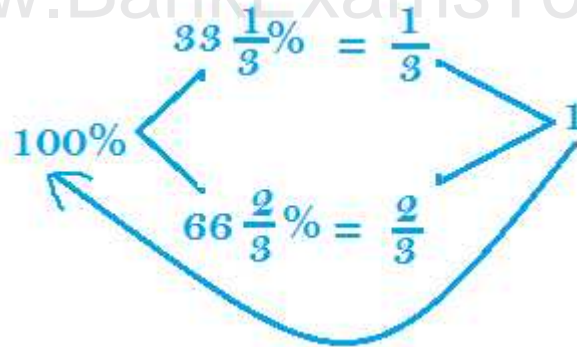
25% = 1/4

6.25% = 1/16

125% = 5/4

150% = 3/2

200% = 2

350% = 7/2

## Examples

### #1

Q. If the difference between 62% of a number and 3/5th of that number is 36. what is the number ?

Sol:

Let the number be x.

Then $x \times 62\% - x \times {}^3/5 = 36$

$x \times 62\% - x \vee 60\% = 36$ (60% = 3/5)

$x \times 2\% = 36$

$x \times {}^2/100 = 36$

$x = {}^{36 \times 100}/2 = 1800$

### #2

Q. 40% of Ram's income Rs. 1200 Then Find

1. **75% of Ram's income ?**
2. **1/4 part of Ram's income ?**
3. **1/3 part of Ram's income ?**

Sol :

**(1)**

40% = 1200 Rs.

75% = 1200/40 ×75 = 2250 Rs.

**Trick :** 1200 / 40  × 75 = Rs. 2250/-

**(2)**

40% of income = Rs. 1200

Then 1/4 part (i.e. 25% ) of Ram's

income = 1200/40 ×25

= Rs. 750/- Ans

**(3)**

40% of Ram's income

= Rs. 1200

i.e. 2/5 part of Ram's income

= Rs. 1200

Then total income of Ram

= Rs. 1200 ×5/2

1/3 part of Ram's income

= Rs. 1200  × 5/2  × 1/3

= Rs. 1000 Ans.

**Trick :**

1200/2/5 × 1/3

= 1200/2 × 5/3 = 1000