

**\* How to solve dimension formula prove:-**

Ex. Prove that  $(KE = \frac{1}{2} m v^2)$  is right or wrong.

- L.H.S formula =  $KE = ML^2.T^{-2}$  (The dimensional formula)

- R.H.S =  $\frac{1}{2} m v^2$  , ( $\frac{1}{2}$  have no formula) so  $m v^2 = M(LT^{-1})^2 = ML^2.T^{-2} = L.H.S$  , the law is right.

**\* How to solve unit covert problems:-**

Ex. 3 Kg = ..... g

- If from big to small, get the number then get the  $10^?$  Value of bigger unit then multiply number with unit and equalize with smaller one and vice versa, answer is  $(3 \times 10^3 \text{ g})$ .

**\* A table of  $10^?$  For Units :-**

Factor	$10^{-15}$	$10^{-9}$	$10^{-6}$	$10^{-3}$	$10^{-2}$	$10^3$	$10^6$	$10^9$	$10^{12}$
Prefix	Pemto	Nano	Micro	Mille	Centi	Kilo	Mega	Giga	Tera
Symbol	F	N	$\mu$	M	C	K	M	G	T

**\* How to solve direct error problem :-**

Absolute error	Relative error
* Its diff. between actual value and measured value. , Law = $\Delta X =  X_0 - X $	* Its diff. between absolute error and real value. , Law = $R = \Delta X \setminus X_0$

**\* How to solve indirect error problem: - \* Length (3 +- 1), Width (2 +- 0.1) , process = Area.**

1) Get absolute	Length = $\Delta X = 1$ , Width = $\Delta X = 0.1$
2) Get relatives	Length = $R = 1 \setminus 3$ , Width = $R = 0.1 \setminus 2$
3) Apply on real	$A_0 = L \times W = 3 \times 2 = 6 \text{ cm}^2$
4) Bec. It X , + R	$R_T = R_1 + R_2 = 1 \setminus 3 + 0.1 \setminus 2 = 23 \setminus 60$
5) Write R law	$X_T \setminus \Delta X_0 = 23 \setminus 60 = X_T \setminus 6$ , $X_T = \Delta (23 \times 6) \setminus 60 = 23 \setminus 10 = 2.3 \text{ cm}$

**\* How to solve distance and displacement problem:-**

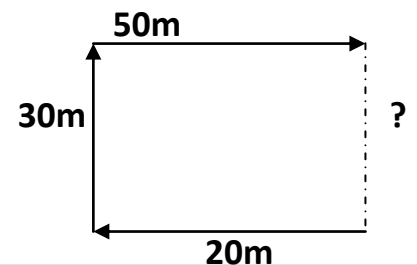
- Calculate the total distance move by body from start to end.

Ex. Body move 20 to east then 30 to north then 50 to west.

|| Total distance =  $20 + 30 + 50 = 100 \text{ m}$  ||

|| Displacement =  $20 \text{ m}$  ||

!!!! This problem is very easy don't let it go from you in exam !!!!

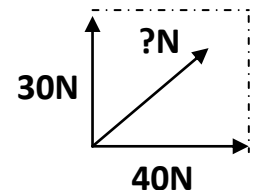


**\* How to solve resultant force problem:-**

Ex. Find R of 2 forces one of them in X axis = 40N and one on Y axis = 30N.

- Law ( $R = \sqrt{F_x^2 + F_y^2}$  under root) ,  $R = \sqrt{(40)^2 + (30)^2}$  under root = 50 N

-  $\Theta = \tan^{-1} (F_y / F_x) = 30 / 40 = 36.87^\circ$



**\* How to solve resolution problem:-**

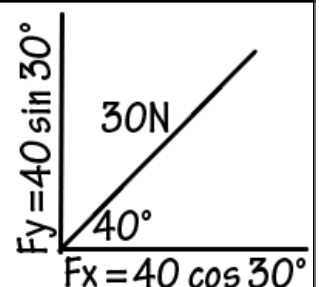
Ex. A boy pull a robe by force 30N and angle  $40^\circ$  , find the components.

- Law ( $F_x = F \cos \Theta$  ,  $F_y = F \sin \Theta$ ) in case  $\Theta$  beside

X axis , if beside Y the laws will conjugated.

$F_x = 30 \cos 40^\circ = 24.3 \text{ N}$

$F_y = 30 \sin 40^\circ = 18 \text{ N}$



**\* How to solve product problem:-**

Ex.  $A = 5$  ,  $B = 10$  ,  $\Theta = 60^\circ$  , Find cross and dot product .

-  $\vec{A} \cdot \vec{B} = AB \cos \Theta = 5 \times 10 \cos 60 = 25$

-  $\vec{A} \wedge \vec{B} = AB \sin \Theta = 5 \times 10 \sin 60 = 43.3$  .  $\vec{N} \perp \vec{AB}$

