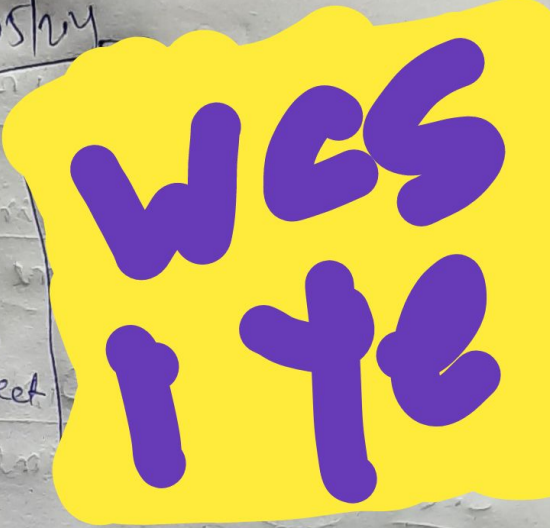


# Speed and velocity 03/05/24



## Rest (stho)

A body is said to be at state Rest, if it occupies the same position with respect of surrounding.

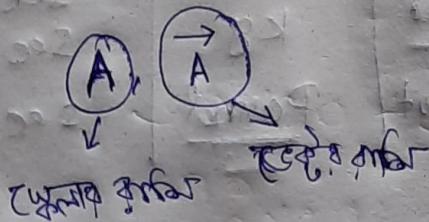
## Motion (stho)

A body is said to be in motion, if it change its position with respect to its surrounding.

## Scalar quantity (stho)

The scalar quantity is one which has only magnitude but no direction.

Eg. Length, Area, Speed, Time.

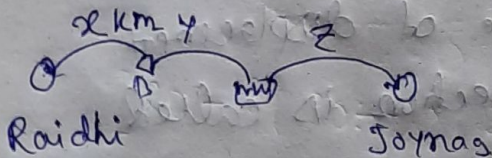


## Vector quantity

The vector quantity is one which has both magnitude and direction.

eg. speed, momentum,

## Distance :-



$$D = (2 + 7 + 3) \text{ km}$$

## Displacement (stho)

(Vector)

$$S = \frac{D}{T}$$

## Speed (stho)

(km)/h  
↓  
stho

$$S = \frac{d}{t}$$



# Unit of speed in C.G.S

$$\text{Speed} = \frac{\text{Distance}}{\text{time}} = \frac{\text{cm}}{\text{sec}} = \text{cm/sec}$$

C.G.S Unit  $\text{Speed} = \frac{\text{Distance}}{\text{time}} = \frac{\text{cm}}{\text{sec}} = \text{cm/sec}$

S.I unit  $= \frac{\text{Distance}}{\text{time}} = \frac{\text{m}}{\text{sec}} = \text{m/sec}$

mks f.P.S. → foot, Pound, sec.

Unit of Speed C.G.S

- 10 — m/sec
- 20 — cm/sec
- 30 — cm/sec
- 40 — m/sec

$$\frac{\text{distance}}{\text{time}} = \frac{\text{foot}}{\text{sec}}$$

<u>B.T.U</u> (f.P.S)	⇒	<u>length</u>	ft/sec	<u>time</u>
		C.G.S	cm	sec
		M.K.S	m	sec
	⇒	foot	Pound	sec

## Velocity (गति)

The rate of change of displacement in a particular direction is called velocity.

$$\text{Velocity} = \frac{\text{Displacement}}{\text{Time}}$$

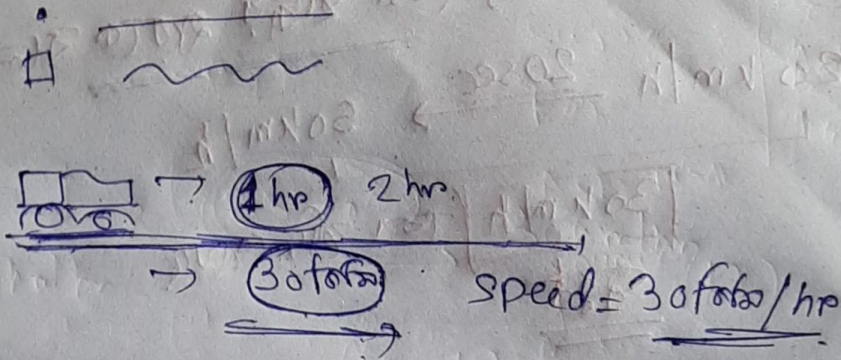
गति गति → गति next class



# Speed (hra)

10/05/2021

$$\text{Speed} = \frac{\text{distance travel}}{\text{time}}$$



~~speed~~ =

speed unit

$$\text{C.G.S} = \frac{\text{Distance}}{\text{time}} = \frac{\text{cm}}{\text{Sec}} = \text{cm/sec}$$

$$\text{S.I} = \frac{\text{Distance}}{\text{time}} = \frac{\text{m}}{\text{s}} = \text{m/s}$$

$$\text{F.P.S} = \frac{\text{Distance}}{\text{time}} = \frac{\text{Foot}}{\text{sec}} = \text{ft/sec}$$

## Velocity (vector)

$$\text{Velocity} = \frac{\text{Displacement}}{\text{Time}} = \frac{\text{vector}}{\text{time}}$$

(1) Initial time  $\frac{\text{vector}}{\text{time}}$

(2) Initial vector

(3)  $\frac{\text{vector}}{\text{time}}$

Unit

$$\text{C.G.S} = \text{cm/sec}$$

$$\text{S.I} = \text{m/sec}$$

$$\text{Fps} = \text{ft/sec}$$

speed  $\rightarrow$  scalar quantity

velocity  $\rightarrow$  vector quantity



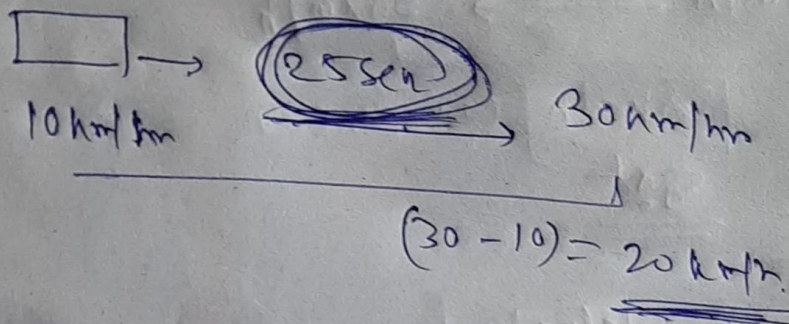
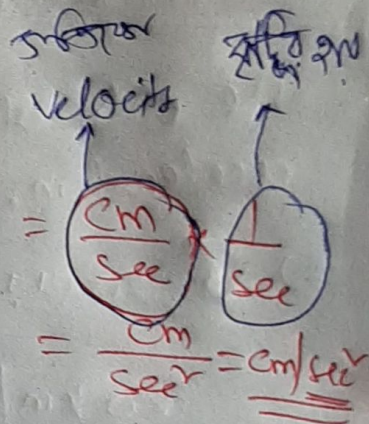




घूर्णत →

समान समान  
तार की गति

$$\text{घूर्णत} = \frac{\text{अवस्थापन}}{\text{समय}} = \frac{\text{cm/sec}}{\text{sec}}$$



1. प्रारम्भिक वेग,  $u$
2. अन्तिम वेग,  $v$
3. समय,  $t$
4. घूर्णत,  $f$

$$v = u + ft \quad \text{--- ①}$$

$$ft = v - u$$

$$\Rightarrow f = \frac{v - u}{t} \quad \text{--- ②}$$

प्रारम्भिक वेग 20 फीट/घंटा → 10 sec  
अन्तिम वेग 30 फीट/घंटा

$$\Rightarrow u = 20 \text{ km/hr}, \quad v = 30 \text{ km/hr}, \quad t = 10 \text{ sec}$$

$$u = 20 \text{ km/hr}$$

$$10 \times 30 \times \frac{5}{18 \times 60} = \frac{5}{6} \text{ m/sec}$$

$$= \frac{10 \times 20 \times 5}{18 \times 9} \text{ m/sec} = \frac{50}{9} \text{ m/sec}$$