Tuesday, August 6, 2024 10:30 PM

s : displacement 位置

v : velocity 速度

a : acceleration 加速

Velocity = rate of change of displacement

$$v = \frac{s}{t} = \frac{\Delta s}{\Delta t}$$

Velocity = instantaneous rate of change of displacement wrt time

$$v = \frac{ds}{dt}$$

acceleration : change of velocity wrt time.

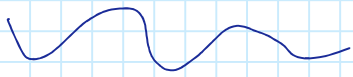
$$a = \frac{\Delta v}{\Delta t} \Rightarrow a = \frac{\text{velocity}}{\text{time}}$$

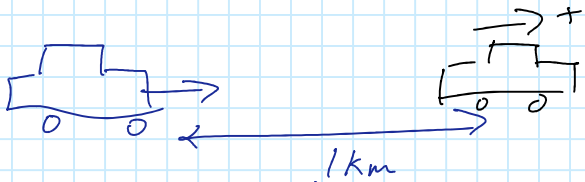
$$a = \frac{\frac{m}{s}}{s}$$

$$a = \frac{m}{s^2}$$

$$a = m s^{-2}$$

$$a = \frac{dv}{dt}$$





1 km in 1 min

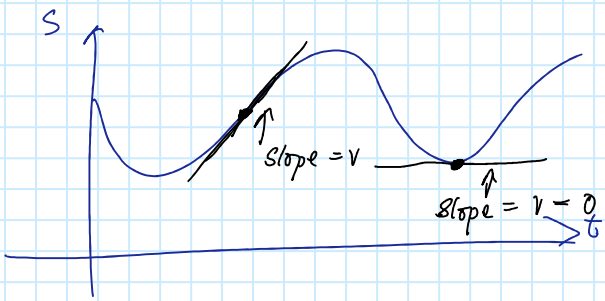
$$v = \frac{+1\ \text{km}}{1\ \text{min}} = \frac{+1\ \text{km}}{\frac{1}{60}\ \text{hr}} = +60\ \text{km/h} = 60\ \text{km h}^{-1}$$

vector

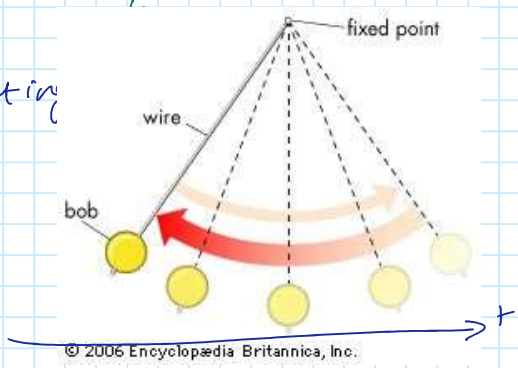
scalar.

normal speed limits : 50 km/h

$$\frac{1}{\frac{1}{60}} \Rightarrow \frac{60 \cdot 1}{60 \cdot \frac{1}{60}}$$

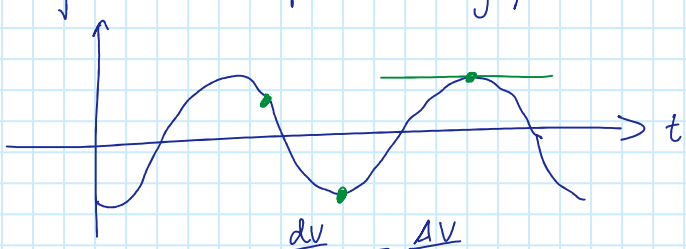


oscillating



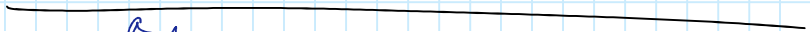
$$v = \frac{ds}{dt} = \frac{\Delta s}{\Delta t}$$

instantaneously v = Slope of s-t graph

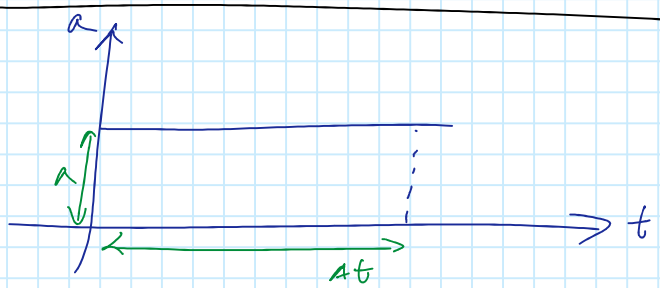


$$a = \frac{dv}{dt} = \frac{\Delta v}{\Delta t}$$

a = Slope of v-t graph



a = Slope of v-t graph



$a = b^2$

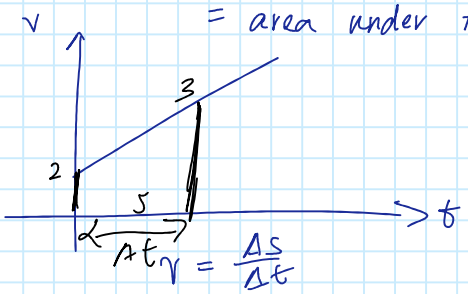
$\sqrt{a} = b \qquad \sqrt{a^2} = a$

$a = \frac{dv}{dt} = \frac{\Delta v}{\Delta t}$

$\Delta v = a \Delta t$

Change in velocity

= area under the a-t graph.



$v = \frac{\Delta s}{\Delta t}$

$\Delta s = v \Delta t$

Change in displacement = area under v-t graph