IG Physics Unit 1 Force & Motion

① Different quantities
Vector, Scalar

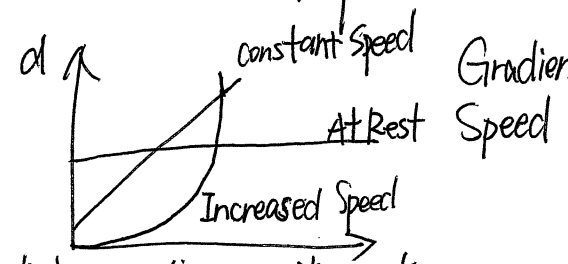
② Type of motion
a. 1 dimension motion
- liner motion
b. 2 dimensions motion
c. 3 dimensions motion
- wave motion

③ Motion Describe
i Speed & Velocity ii Acceleration
Initial speed : u
Final speed : v

$\frac{\text{Distance}}{\text{Time Taken}}$ $\frac{\text{Displacement}}{\text{Time Taken}}$

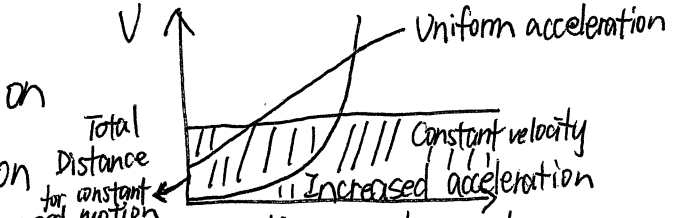
$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total Time}}$

④ Motion Graph



distance-time graph

Gradient: Speed



Velocity-time graph

Gradient: Acceleration

⑤ Newton's Law of Motion
1st Law of Motion : Inertia Law of Motion
2nd Law of Motion : $\vec{\Sigma F} = m\vec{a}$
3rd Law of Motion : Action & Reaction Force

⑥ Free-Fall (↓↑ Means Direction of the Force)

Part 1. Release from the Top
$v = 0 m/s$ $\vec{g}\downarrow$

Part 2 Acceleration downward
$g\downarrow$ (constant) Air Resistance ↑ (Increasing) $V\downarrow$ (Decreasing Acceleration)

Part 3 Achieve to Terminal Speed
$g\downarrow$ = Air Resistance ↑ $\Sigma\vec{F} = 0N$ (constant speed)

Part 4 Decreasing deceleration
$g\downarrow$ (constant) $V\downarrow$ (Decreasing) Air Resistance ↑ $g\downarrow <$ Air Resistance ↑ $\Sigma F\uparrow$

Part 5 Second Time reach Terminal Speed
Air Resistance ↑ $g\downarrow$ $\Sigma F = 0N$

→ Continue

IG Physics Unit 1 Force & Motion (cont.)

⑦ Type of Force

Contact Force: Tension, Friction, Air Resistance

Non-Contact Force: Buoyancy, Electronic

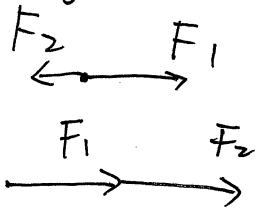
⑧ Stopping Distance

i Thinking Distance: Driver, Initial Speed

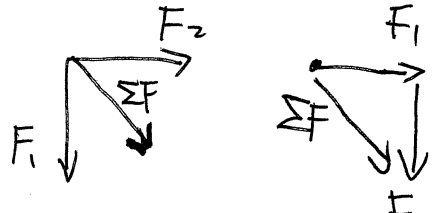
ii Braking Distance: Initial Speed, Weather, Wheel, Condition of road

⑨ Analyze Resultant Force

1D



2D



Linking knowledge: Check your IG Math textbook, find Vector and get more information.

⑩ Hooke's Law

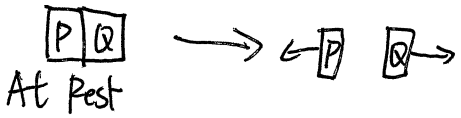
i The relationship between extension & external force.

ii Formula: $F = ke$ (under proportional limit)

⑪ Momentum

i Formula $\vec{p} = m\vec{v}$

ii Conservation of Momentum



$$m_P\vec{u_P} + m_Q\vec{u_Q} = m_P\vec{v_P} + m_R\vec{V_Q}$$

iii Impulse: The change of the momentum

$$I = \Delta\vec{p} = \vec{F} \cdot \Delta t$$