

Kinematics - study of motion

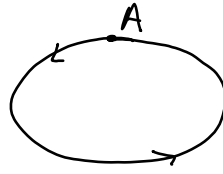
I. Definitions



A. Position, distance, displacement

B. Speed, velocity

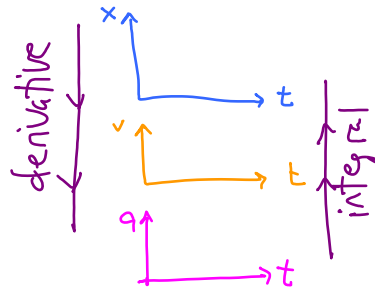
$$\bar{v} = \frac{\Delta x}{\Delta t}, \quad v = \frac{dx}{dt}$$



C. acceleration

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

D. Graphs



II Constant acc. eq.

$$v_2 = v_1 + at$$

$$x = v_1 t + \frac{1}{2} at^2$$

$$v_2^2 = v_1^2 + 2ax$$

III. Vectors

(A) Projectiles

$$1. x = v_x t$$

2. $a = g$ for constant acc. eqs.

(B) Plane/wind & boat/river

1. time to
land



2. θ to go
straight across



3. θ is aimed straight

(C) How the motion appears.

1. Box out of plane

(a) to pilot

(b) to person on ground.

Test Format

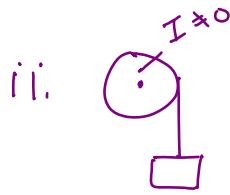
35 MC in 45 min (-1/4 for wrong)

3 F.R. in 45 min.

1. General mechanics

2. Rotation

(A) Fixed axis



(B) Rolling

(C) Angular momentum

3. other

(A) SHM

(B) $U(x)$

(C) Resistive force

(D) Gravity, orbits

LAB component for 1 of 3.