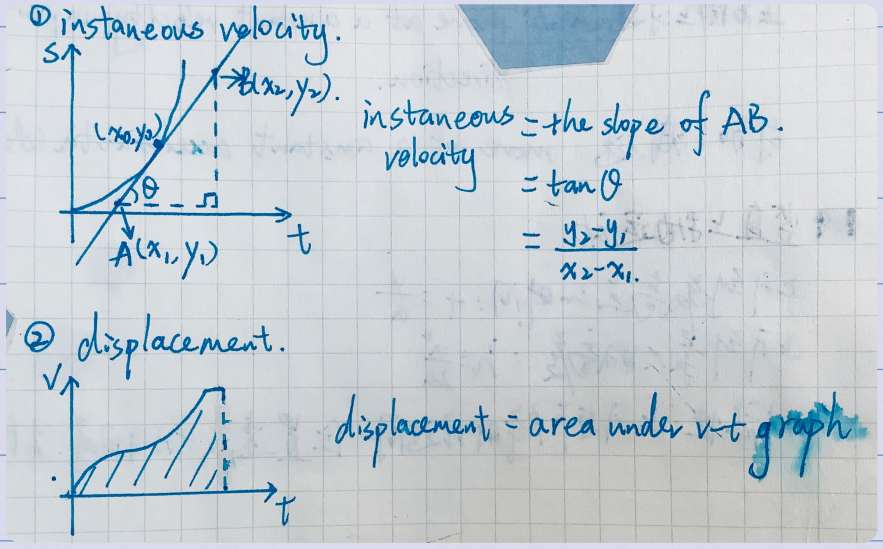
Velocity and acceleration

- rate of velocity

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

{ velocity
{ speed.

- 平均/瞬时速度



- Acceleration

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

def. rate of change of momentum

- 大三式

$v = u + at$

$s = ut + \frac{1}{2}at^2$

$v^2 = u^2 + 2as$

Motion graphs

- Displacement – time graph
  gradient: velocity
- Velocity – time graph
  gradient : acceleration.
  area : displacement.
- Acceleration – time graph.
  area: velocity.

Adding force

- Vector diagram
  - tail to tail
  - tip to tip

  resultant force 合力

- Free-body force diagram

Moments

- Calculate

moment (Nm) = force x moment arm

$\vec{M} = Fx$

- Principle of moments

If sum of clockwise moments = sum of anticlockwise moments

then, the body is in equilibrium

equilibrium: the resultant force is 0 in the object

- Centre of gravity

def. a point at which all the weight force appears to act on

不规则物体找重心

Newton's law of motion

- N1 平衡力

every object continues its state of rest or uniform motion in a straight line unless made to change by the total force acting on it

- N2

$F=ma$

加速度与物体质量呈反比.

- N3 相互作用力

When an object A causes a force on another object B, then object B causes an equal force in the opposite direction to act upon object A

- 相同点
  - magnitude
  - time
  - type
- 不同点
  - opposite direction
  - different bodies