

VARIABLE ACCELERATION

KEY WORDS & DEFINITIONS

- Velocity**
The rate of change of displacement
- Acceleration**
The rate of change of velocity

FORMULAE

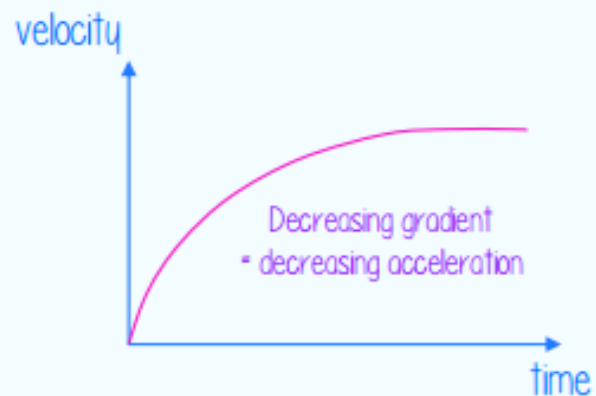
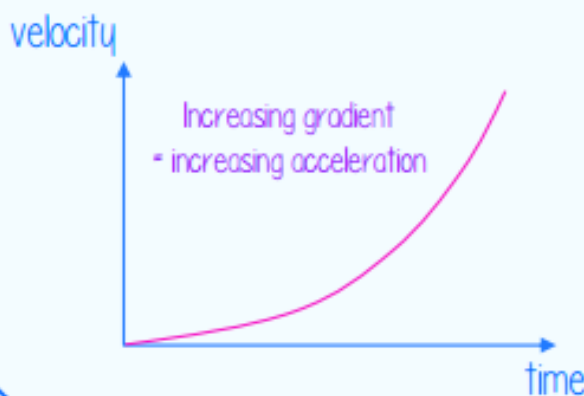
Velocity, if displacement is a function of time:

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

Acceleration, if velocity is a function of time

$$a = \frac{dv}{dt} = \frac{d^2s}{dt^2}$$

VELOCITY TIME GRAPHS



WHAT DO I NEED TO KNOW

- The area under a velocity time graph represents the displacement
- Integration is the reverse process to differentiation
- Differentiate displacement with respect to time to get velocity
- Differentiate velocity with respect to time to get acceleration
- Integrate acceleration with respect to time to get velocity

$$\int (a) dt = v$$

- Integrate velocity with respect to time to get displacement

$$\int (v) dt = s$$

- The suvat equations can only be used when the acceleration is constant