



VARIABLE



ACCELERATION

KEY WORDS & DEFINITIONS

1. **Velocity**
The rate of change of displacement
2. **Acceleration**
The rate of change of velocity

FORMULAE

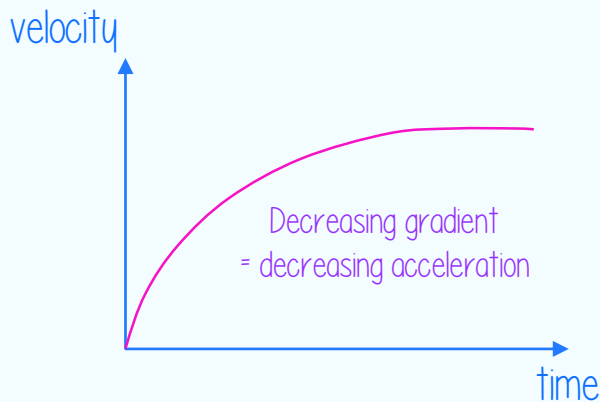
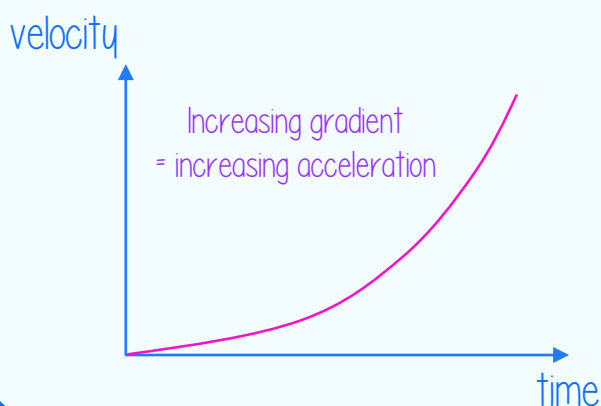
Velocity, if displacement is a function of time:

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

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

1. The area under a velocity time graph represents the displacement
2. Integration is the reverse process to differentiation
3. Differentiate displacement with respect to time to get velocity
4. Differentiate velocity with respect to time to get acceleration
5. Integrate acceleration with respect to time to get velocity

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

6. Integrate velocity with respect to time to get displacement

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

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