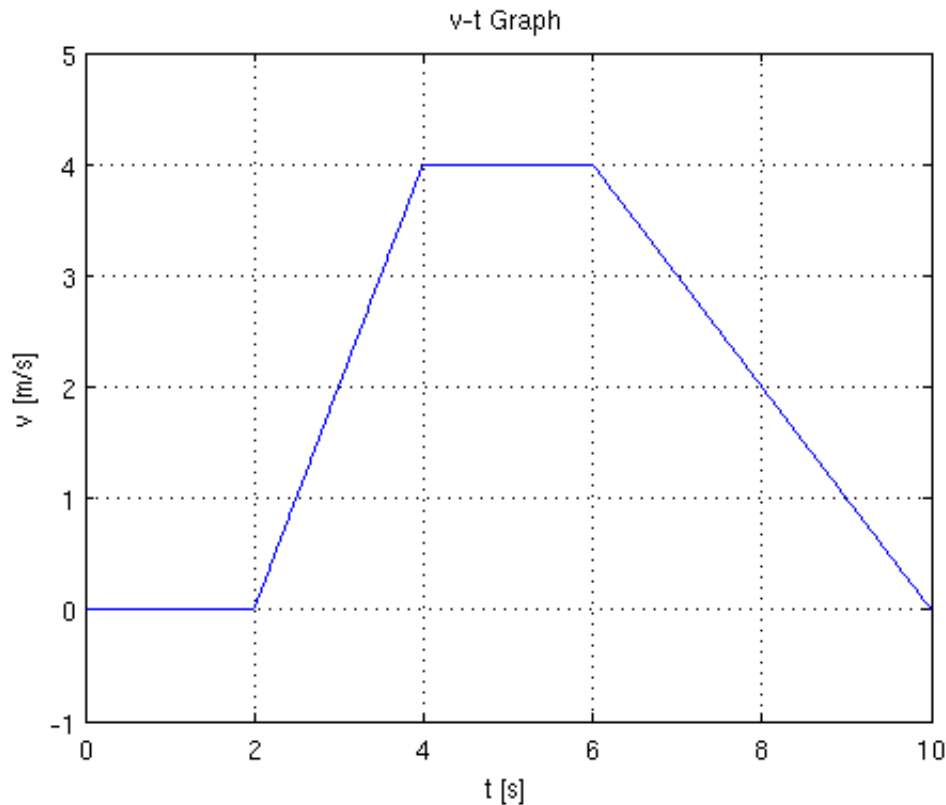


## 1D-Kinematics: v-t Graphs

Velocity is the change in position over time  $v_{av} = \frac{\Delta s}{\Delta t}$  . Eq1

A v-t graph plots the velocity (v) of an object as a function of time (t). The x-axis represents the time, the y-axis represents the velocity of the object at each moment.

In the example below, an object has no velocity between t=0s and 2s. It then speeds up to 4m/s at t=4s and keeps that velocity until t=6s. Between t=6s and 10s, it is slowing down to 0m/s.



The acceleration is defined as change in velocity over time:  $a_{av} = \frac{\Delta v}{\Delta t}$  . It is the slope of the v-t graph at any given point.

### Tasks

1. Find the acceleration at t=1s, 3s, 5s and 8s
2. Solve Eq1 for the change in position (  $\Delta s = ?$  ).
3. Between t=0s and t=2s, how much did the position change (  $\Delta s = ?$  )
4. Between t=2s and t=4s, how much did the position change (  $\Delta s = ?$  )
5. Between t=4s and t=6s, how much did the position change (  $\Delta s = ?$  )
6. Where is the object at t=10s if it started at s(t=0)=0m?