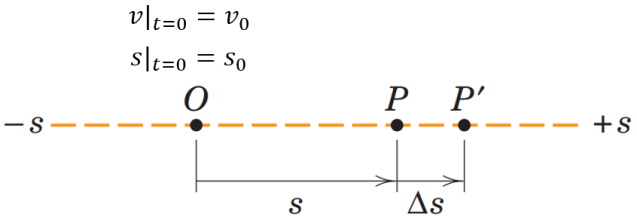
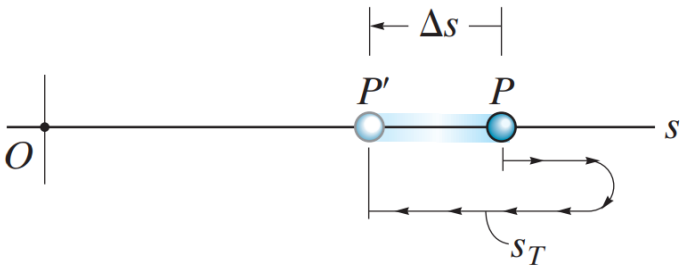


$$v_{avg} = \frac{\Delta s}{\Delta t} \qquad v = \frac{ds}{dt}$$

$$v_{avg} = \frac{\Delta s}{\Delta t}$$



$$\text{Average Speed} = \frac{S_T}{\Delta t}$$

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

$$a = \frac{dv}{dt}$$

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

$$ads = v\,dv$$

$$a = \frac{dv}{dt} \nearrow$$

The acceleration of a particle as it moves along a straight line is given by $a = (2t - 1)$ m/s^2, where t is in seconds, If $s = 1$ m and $v = 2$ m/s when $t = 0$, determine the particle's velocity and position when $t = 6$ s. Also, determine the total distance the particle travels during this time period.

A particle travels along a straight line with a velocity $v = (12 - 3t^2)$ m/s, where t is in seconds. When $t = 1$ s, the particle is located 10 m to the left of the origin. Determine the acceleration when $t = 4$ s, the displacement from $t = 0$ s to $t = 10$ s, and the distance the particle travels during this time period.

When a train is traveling along a straight track at 2 m/s, it begins to accelerate at $(60v^4)$ m/s^2 where v is in m/s. Determine its velocity v and the position 3 s after the acceleration.

A particle is moving along a straight line such that its velocity is defined as $v = (-4s^2)\text{m/s}$, where s is in meters. If $s = 2$ m when $t = 0$, determine the velocity and acceleration as functions of time.