

#4

A particle moves along the x -axis so that its acceleration at any time t is given by $a(t) = 6t - 18$. At time $t = 0$ the velocity of the particle is $v(0) = 24$, and at time $t = 1$, its position is $x(1) = 20$.

- Write an expression for the velocity $v(t)$ of the particle at any time t .
- For what values of t is the particle at rest?
- Write an expression for the position $x(t)$ of the particle at any time t .
- Find the total distance traveled by the particle from $t = 1$ to $t = 3$.

#5

A particle moves along the x -axis in such a way that its acceleration at time t for $t \geq 0$ is given by $a(t) = 4\cos(2t)$. At time $t = 0$, the velocity of the particle is $v(0) = 1$ and its position is $x(0) = 0$.

- Write an equation for the velocity $v(t)$ of the particle.
- Write an equation for the position $x(t)$ of the particle.
- For what values of t , $0 \leq t \leq \pi$, is the particle at rest?

#6

A particle moves on the x -axis so that its position at any time $t \geq 0$ is given by $x(t) = 2te^{-t}$.

- Find the acceleration of the particle at $t = 0$.
- Find the velocity of the particle when its acceleration is 0.
- Find the total distance traveled by the particle from $t = 0$ to $t = 5$.