

Solutions

Each answer shows the steps, then the **result**.

2.1

- $v = u + at = 4 + 3(5) = 19 \text{ m s}^{-1}$

2.2

- $\text{gradient} = \frac{14 - 2}{6 - 0} = 2 \text{ m s}^{-2}$

3.1 C

- $v = u + gt = 0 + 10(3) = 30 \text{ m s}^{-1}$

3.2

(a)

- $v^2 = u^2 + 2as$: $0 = 30^2 + 2a(75)$; $a = -\frac{900}{150} = -6$, so deceleration 6 m s^{-2}

(b)

- $v = u + at$: $0 = 30 - 6t \Rightarrow t = 5 \text{ s}$

3.3

(a)

- $v = 0$: $12t - 3t^2 = 0 \Rightarrow 3t(4 - t) = 0 \Rightarrow t = 4 \text{ s}$

(b)

- $v \geq 0$ for $0 \leq t \leq 4$, so distance $= \int_0^4 (12t - 3t^2) dt = [6t^2 - t^3]_0^4 = 96 - 64 = 32 \text{ m}$