

$$\text{D) a) } v_f = v_i + at$$

$$= 0 + (2.5)(35)$$

$$v_f = \boxed{87.5 \text{ m/s}}$$

$$\text{b) } v_f^2 = v_i^2 + 2ad$$

$$a = \frac{v_f^2 - v_i^2}{2d}$$

$$= \frac{17^2 - 3^2}{2(5000)}$$

$$a = \boxed{0.028 \text{ m/s}^2}$$

$$\text{c) } d = v_i t + \frac{1}{2} a t^2$$

$$v_i = \frac{d - \frac{1}{2} a t^2}{t}$$

$$= \frac{30}{1.4} - \frac{1}{2} (6.2)(1.4)$$

$$v_i = \boxed{17.1 \text{ m/s}}$$

$$\text{d) } d = \left(\frac{v_f + v_i}{2} \right) t$$

$$t = \frac{2d}{v_f + v_i}$$

$$= \frac{2(865.5)}{(5 + 6.5)}$$

$$t = \boxed{63.1 \text{ s}}$$

$$e) d = \left(\frac{v_f + v_i}{2} \right) t$$
$$= \left(\frac{7.65 + 3.72}{2} \right) 8.3$$

$$d = \boxed{47.2 \text{ m}}$$

$$f) v_f^2 = v_i^2 + 2ad$$

$$d = \frac{v_f^2 - v_i^2}{2a}$$
$$= \frac{(9.75)^2 - (20.3)^2}{2(-2.56)}$$

$$d = \boxed{61.9 \text{ m}}$$

$$\textcircled{2} \quad v_i = 25 \text{ m/s}$$

$$v_f = 35 \text{ m/s}$$

$$a = 1.7 \text{ m/s}^2$$

$$a) \quad t = ?$$

$$v_f = v_i + at$$

$$t = \frac{v_f - v_i}{a}$$

$$= \frac{35 - 25}{1.7}$$

$$t = \boxed{5.9 \text{ s}}$$

$$b) \quad d = ?$$

$$v_f^2 = v_i^2 + 2ad$$

$$d = \frac{v_f^2 - v_i^2}{2a}$$

$$= \frac{(35)^2 - (25)^2}{2(1.7)}$$

$$d = \boxed{176.5 \text{ m}}$$

3

$$\begin{aligned}v_f &= 0 \\v_i &= 150 \text{ m/s} \\d &= 2500 \text{ m} \\a &= ?\end{aligned}$$

$$v_f^2 = v_i^2 + 2ad$$

$$a = \frac{v_f^2 - v_i^2}{2d}$$

$$a = \frac{0 - (150)^2}{2(2500)}$$

$$a = \boxed{-4.5 \text{ m/s}^2}$$

4

$$v_i = 150 \text{ km/h} = 41.6 \text{ m/s}$$

$$a = 2.0 \text{ m/s}^2$$

$$d = 2000 \text{ m}$$

$$t = ?$$

$$d = v_i t + \frac{1}{2} a t^2$$

$$2000 = 41.6t + \frac{1}{2}(2)t^2$$

$$t^2 + 41.6t - 2000 = 0$$

$$t = \frac{-41.6 \pm \sqrt{(41.6)^2 - 4(1)(-2000)}}{2(1)}$$

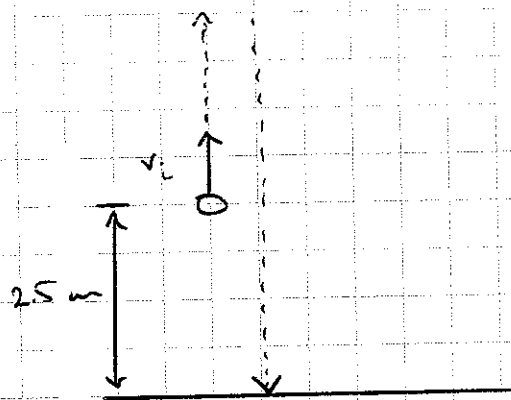
$$t = 28.5 \text{ s} \quad \text{or} \quad -73.2 \text{ s}$$

$$t = \boxed{28.5 \text{ s}}$$

5)

$$v_i = +8.0 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2$$



a) $d = -25 \text{ m}$
 $t = ?$

$$d = v_i t + \frac{1}{2} a t^2$$

$$-25 = 8t + \frac{1}{2}(-9.8)t^2$$

$$4.9t^2 - 8t - 25 = 0$$

$$t = \frac{+8 \pm \sqrt{(-8)^2 - 4(4.9)(-25)}}{2(4.9)}$$

$$t = \frac{8 \pm 10.63}{9.8}$$

$$t = 1.90 \text{ s} \quad \text{or} \quad -0.77 \text{ s}$$

$$t = \boxed{1.90 \text{ s}}$$

b) $v_f = 0$
 $d = ?$

$$v_f^2 = v_i^2 + 2ad$$

$$d = \frac{v_f^2 - v_i^2}{2a}$$

$$= \frac{0 - (8)^2}{2(-9.8)}$$

$$d = \boxed{3.27 \text{ m}}$$