

p 82

(97)



$$\Delta d = 1.2 \text{ m}$$

$$a = -1.62 \text{ m/s}^2$$

$$(v_i = 0 \text{ m/s}) \quad \Delta t = ?$$

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

$$\Delta t = \sqrt{\frac{2\Delta d}{a}} = \sqrt{\frac{2(-1.2 \text{ m})}{-1.62 \text{ m/s}^2}}$$

$$\Delta t = \sqrt{\frac{2.4 \text{ m}}{1.62 \text{ m/s}^2}} = \sqrt{1.48 \text{ s}^2} = \boxed{1.2 \text{ s}}$$

(100)



$$v_i = -2.0 \text{ m/s}$$

$$\Delta d = -2.5 \text{ m}$$

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

$$v_f = ?$$

$$v_f^2 = v_i^2 + 2a\Delta d$$

$$v_f = \sqrt{(-2.0 \text{ m/s})^2 + 2(-9.8 \text{ m/s}^2)(-2.5 \text{ m})}$$

$$= \sqrt{4.0 \text{ m}^2/\text{s}^2 + 49 \text{ m}^2/\text{s}^2} = \sqrt{53 \text{ m}^2/\text{s}^2}$$

$$v_f = \boxed{7.2 \text{ m/s}}$$

(101)



$$v_i = 2.0 \text{ m/s}$$

$$\Delta d = -2.5 \text{ m}$$

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

$$v_f = ?$$

$$v_f^2 = v_i^2 + 2a\Delta d$$

$$v_f = \sqrt{(2.0 \text{ m/s})^2 + 2(-9.8 \text{ m/s}^2)(-2.5 \text{ m})}$$

$$= \sqrt{53 \text{ m}^2/\text{s}^2} = \boxed{7.2 \text{ m/s}}$$

(102)



$$\Delta t = 2.2 \text{ s}$$

$$(\Delta t)_{v_2 = 1.1 \text{ s}}$$

$$(v_i = -v_f) \quad (v_{v_2} = 0)$$

$$\Delta d = ?$$

trip down:

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

$$\Delta d = \frac{1}{2} (-9.8 \text{ m/s}^2)(1.1 \text{ s})^2$$

$$\Delta d = \boxed{-5.4 \text{ m}}$$

$$\text{height} = \boxed{5.4 \text{ m}}$$

$$v_i = ?$$

$$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{\Delta t} = \frac{-v_i - (-v_i)}{\Delta t} \quad (\text{b/c } v_f = -v_i)$$

$$v_i = \frac{-a \Delta t}{2} = \frac{-(-9.8 \text{ m/s}^2)(2.2 \text{ s})}{2} = \boxed{10.8 \text{ m/s}}$$