

Giancoli Ch. 3 # 29, 31, 35

29

$$\Delta x = v_x \Delta t$$

$$\frac{36.6 \text{ m}}{22 \text{ m/s}} = \Delta t = 1.62 \text{ s}$$

$$\Delta y = v_{iy} \Delta t + \frac{1}{2} a t^2$$

$$\Delta y = + \frac{1}{2} (-9.81 \text{ m/s}^2)(1.62 \text{ s})^2 = \boxed{12.9 \text{ m}}$$

31

$$\Delta y = v_{iy} \Delta t + \frac{1}{2} a t^2$$

$$-160 \text{ m} = \frac{1}{2} (-9.81 \text{ m/s}^2)(\Delta t)^2$$

$$\Delta t = \boxed{5.71 \text{ s}}$$

35

$$a) v_{fy}^2 = v_{iy}^2 + 2a\Delta y$$

$$\Delta y = 92.6 \text{ m}$$

$$b) \Delta y = v_{iy} \Delta t + \frac{1}{2} a t^2$$

$$t = 0 \pm \boxed{8.69 \text{ s}}$$

$$c) x = v_x t = \boxed{539 \text{ m}}$$

$$d) v_{\text{tot}} = \sqrt{v_x^2 + v_y^2} = \boxed{68.0 \text{ m/s}}$$

$$\tan \theta = \frac{v_y}{v_x} \Rightarrow \theta = \boxed{24.2^\circ \text{ above horizontal}}$$