

PHY HW
6.1

$$\textcircled{a} \quad \bar{a} = \frac{\Delta v}{\Delta t} = \frac{26.3 \text{ m/s} - 0 \text{ m/s}}{.59 \text{ s}} = 44.57 \text{ m/s}^2 \approx 45 \text{ m/s}^2$$

20)  $\rightarrow +$

$$m = 873 \text{ kg} \quad v = 26.3 \text{ m/s} \quad \textcircled{b} \quad F = ma = (873 \text{ kg})(44.57 \text{ m/s}^2)$$
$$\Delta t = .59 \text{ s} \quad F = 38909 \text{ N} \approx 39000 \text{ N}$$

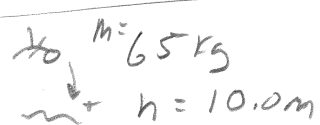
22)  $\rightarrow +$

$$m = 1550 \text{ kg} \quad v_0 = 10.0 \text{ m/s}$$
$$\Delta t = 10.0 \text{ s} \quad v = 30.0 \text{ m/s}$$

$$F = ma = (1550 \text{ kg}) \left(\frac{30.0 \text{ m/s} - 10.0 \text{ m/s}}{10 \text{ s}} \right)$$

$$F = 3.10 \times 10^3 \text{ N}$$

$$F = ?$$

23)  $m = 65 \text{ kg}$
 $h = 10.0 \text{ m}$

$$\textcircled{a} \quad v^2 = v_0^2 + 2ad$$
$$= \sqrt{0 \text{ m/s}^2 + 2(9.80 \text{ m/s}^2)(10.0 \text{ m})}$$

$$v = ?$$

$$v = 14 \text{ m/s}$$

$$\textcircled{b} \quad a = ? \quad v^2 = v_0^2 + 2ad$$

$$\Delta d = 2.0 \text{ m}$$

$$a = \frac{v^2 - v_0^2}{2ad} = \frac{0 \text{ m/s}^2 - 14 \text{ m/s}^2}{2(2.0 \text{ m})} = -49 \text{ m/s}^2$$

$$F = ma = (65 \text{ kg})(49 \text{ m/s}^2)$$

$$F = 3185 \text{ N} \approx 3200 \text{ N}$$

25)  $\rightarrow +$

$$d = d_0 + v_0 t + \frac{1}{2} a t^2$$
$$m = 710 \text{ kg} \quad \Delta d = 40.0 \text{ m} \quad a = \frac{2d}{t^2} = \frac{2(40.0 \text{ m})}{(3.0 \text{ s})^2} = 8.89 \text{ m/s}^2$$
$$v_0 = 0 \text{ m/s} \quad \Delta t = 3.0 \text{ s}$$

$$F = ?$$

$$F = ma = (710 \text{ kg})(8.89 \text{ m/s}^2) = 6311 \text{ N} \approx 6300 \text{ N}$$

21)  $\rightarrow m = 873 \text{ kg} \quad d = d_0 + v_0 t + \frac{1}{2} a t^2$

$$\Delta d = 402.3 \text{ m} \quad a = \frac{2d}{t^2} = \frac{2(402.3 \text{ m})}{(4.936 \text{ s})^2} = 33.0 \text{ m/s}^2$$
$$\Delta t = 4.936 \text{ s}$$

$$a = ?$$

$$v = ?$$

$$v = v_0 + at = 0 \text{ m/s} + (33.0 \text{ m/s}^2)(4.936 \text{ s}) = 163 \text{ m/s}$$