

1-5. on your own

6. $\Sigma F = ma$

$$= (25)(2.2)$$

$$= \boxed{55 \text{ N}}$$

7. on your own

8. $V_i = 0 \text{ m/s}$

$$V_f = 85 \frac{\text{km}}{\text{h}} = 24 \text{ m/s}$$

$$a = .05 \text{ m/s}^2$$

$$\Sigma F = ma$$

$$a = \frac{\Sigma F}{m} = \frac{7.5 \times 10^5 \text{ N}}{1.5 \times 10^7 \text{ kg}}$$

$$= .05 \text{ m/s}^2$$

$$\Delta t = \frac{V_f - V_i}{a} = \frac{24 - 0}{.05}$$

$$= \boxed{480 \text{ s}}$$

9.

$$\Sigma F = F_{\text{rope}} + F_g = ma$$

$$F_{\text{rope}} = ma - F_g$$

$$= m(a - g)$$

$$= (5.0)(3.0 - (-9.80))$$

$$= \boxed{64 \text{ N}}$$

10. $a = \frac{\Sigma F}{m} = \frac{12 \text{ N}}{32 \text{ kg}} = .38 \text{ m/s}^2$

a) $a = .38 \text{ m/s}^2$

$$V_i = 0 \text{ m/s}$$

$$\Delta d = ?$$

$$\Delta t = 3.5 \text{ s}$$

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

$$= \frac{1}{2} (.38)(3.5)^2$$

$$= \boxed{2.3 \text{ m}}$$

b)

mass of child

$$m = \frac{F_g}{g} = \frac{-85 \text{ N}}{-9.80}$$

$$= 8.7 \text{ kg}$$

$$a = \frac{\Sigma F}{m} = \frac{12 \text{ N}}{40 \text{ kg}}$$

$$= .30 \text{ m/s}^2$$

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

$$= \frac{1}{2} (.30)(3.5)^2$$

$$= \boxed{1.8 \text{ m}}$$

11. $F_g = mg$ $m = \frac{F_g}{g} = \frac{-8820}{-9.80} = 900 \text{ kg}$

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

$$V_f = 0 \text{ m/s}$$

$$\Delta d = 1100 \text{ m}$$

$$a = \frac{V_f^2 - V_i^2}{2 \Delta d}$$

$$\Sigma F = ma$$

$$= m \left(\frac{V_f^2 - V_i^2}{2 \Delta d} \right)$$

$$= 900 \left(\frac{0^2 - (35)^2}{2(1100)} \right)$$

$$= \boxed{-500 \text{ N}}$$

14. on your own

15. on your own

12. on your own

13. $F_{g, \text{earth}} = mg$

a)

$$m = \frac{F_{g, \text{earth}}}{g}$$

$$F_{g, \text{moon}} = m g_{\text{moon}}$$

$$= \left(\frac{F_{g, \text{earth}}}{g} \right) \left(\frac{1}{6} g \right)$$

$$= \boxed{.88 \text{ N}}$$

b) $F_{g, \text{Jupiter}} = \left(\frac{F_{g, \text{earth}}}{g} \right) (2.64g)$

$$= \boxed{14.0 \text{ N}}$$