Homework Answers I (chapters 2. 4. 5. 6)

2.18 (a) $V_{ave} = 13\ m/s$ (b) $10\ m/s,\ 16\ m/s$. (c) $a_{ave} = 6\ m/s^2$

(d) $a = 6\ m/s^2$ (e) $t = 0.333\ s$

4.26 (a) $t = \frac{V_i \sin\theta}{g}$ (b) $h_{max} = h + \frac{(V_i \sin\theta)^2}{2g}$

4.48 (a) $t = \sqrt{\frac{2h}{g}}$ (b) $V_{xi} = d\sqrt{\frac{g}{2h}}$

(c) $V_{yf} = -\sqrt{2gh}$ (d) $\theta_f = \tan^{-1}\left(\frac{2h}{d}\right)$

4.68 (a) $V_i > \sqrt{gR}$ (b) $(\sqrt{2} - 1)R$

5.20 (a) $T = 49\ N$ (b) $T = 49\ N$ (c) $T_2 = 98\ N$ (d) $T = 24.5\ N$

5.30 (b) $a = 3.57\ m/s^2$. (c) $T = 26.7\ N$ (d) $V_f = 7.14\ m/s$

5.32 (a) $T_2 = m(g + a)$ (b) $T_1 = 2T_2$ (c) $T_1 = 2T_2 = 0$

5.34 (a) $a_2 = 2a_1$ (b) $T_2 = \frac{m_1 m_2}{2m_2 + \frac{1}{2}m_1} g$ & $T_2 = \frac{m_1 m_2}{m_2 + \frac{1}{4}m_1} g$

(c) $a_1 = \frac{1}{2}a_2 = \frac{m_1 g}{4m_2 + m_1}$

6.16 (a) $n = 2.49 \times 10^4\ N$ (b) $V_{max} = 12.1\ m/s$

6.44 (a) $T_1 = 217\ N$ (b) $T_2 = 283\ N$

(c) string 2 will break first.

6.68 (a) $\theta = 70.4°$ and $\theta = 0°$

(b) $\theta = 0°$