

3.11

- (a) $a_A = 3.10 \text{ m/s}^2 \downarrow$, $a_B = 6.20 \text{ m/s}^2 \downarrow$, $a_C = 12.39 \text{ m/s}^2 \leftarrow$
- (b) $T_{AB} = 13.42 \text{ N}$, $T_{BC} = 24.78 \text{ N}$
- (c) $\Delta x_A = 6.20 \text{ m} \downarrow$

3.12

- (a) $\mathbf{a}_B = (1.47\mathbf{i} - 5.76\mathbf{j}) \text{ m/s}^2$ $\left(5.94 \text{ m/s}^2 \searrow 75.7^\circ\right)$
- (b) $\mathbf{v}_{B/A} = (3.51\mathbf{i} - 1.28\mathbf{j}) \text{ m/s}$ $\left(3.74 \text{ m/s} \searrow 20^\circ\right)$

3.14

- (a) $\rho = 668 \text{ ft}$
- (b) $N = 120 \text{ lb}$

3.21

- (a) $v_{\max} = 45.4 \text{ m/s}$
- (b) $\tan \theta = \frac{v_0}{\sqrt{v_0^2 + 2gh}}$
- (c) $\theta = 43.7^\circ$, $d = 219.8 \text{ m}$
- (d) $\rho_{\text{launch}} = 290.5 \text{ m}$, $\rho_{\text{apex}} = 109.8 \text{ m}$

3.24

$$|v| = \frac{b\dot{\theta}}{\cos^2\theta} \text{ , } |a| = \frac{b}{\cos^2\theta} |2\ddot{\theta}\tan\theta + \ddot{\theta}|$$

3.26

$$\mathbf{v} = (-4.94\mathbf{e}_r + 7.5\mathbf{e}_\theta) \text{ ft/s} \text{ , } |N| = 2.30 \text{ lb}$$