

5.4: Selected Answers

¹ $\theta_2 = 3.53 \text{ rad}$

² $t = 0.97 \text{ s}$

³ $\theta_{B2} = 8.98 \text{ rad/s}$

⁴ $t = 1.55 \text{ s}$

⁵ $v_1 = 12.3 \text{ m/s}$

⁶ $t = 2.39 \text{ s}$

⁷ $t_2 = 2.8 \text{ s}$

⁸ $\alpha = 45.7 \text{ rad/s}^2$

⁹ $\omega_2 = 35.6 \text{ rad/s}$

¹⁰ $a = 0.65 \text{ m/s}^2$

¹¹ $\alpha = 2.92 \text{ rad/s}^2$

¹² $t_2 = 7.5 \text{ s}$

¹³ $t_2 = 2.65 \text{ s}$

¹⁴ $a_{\text{block}} = 0.256 \text{ m/s}^2$

¹⁵ $a_{\text{truck}} = 0.056 \text{ m/s}^2$

¹⁶ $a_{\text{truck}} = 0.099 \text{ m/s}^2$

¹⁷ $\Delta r_{\text{block}} = 203 \text{ m}$

¹⁸ $F_{\text{rope}} = 477 \text{ N}$

¹⁹ $F_{\text{rope}} = 266 \text{ N}$

²⁰ $F_{\text{rope}} = 375 \text{ N}$

²¹ $F_{\text{right support}} = 9.8 \text{ N}$ $F_{\text{left support}} = 1117 \text{ N}$

²² $F_{\text{right support}} = 1269 \text{ N}$ $F_{\text{left support}} = 446 \text{ N}$

²³ $F_{\text{sf}} = 514 \text{ N}$

²⁴ $F_{\text{minimum}} = 867 \text{ N}$

²⁵ $a_{\text{student}} = 0.23 \text{ m/s}^2$

²⁶ $a_{\text{student}} = 0.14 \text{ m/s}^2$

²⁷ $F_{\text{right rope}} = 503 \text{ N}$

²⁸ $m_{\text{block}} = 117 \text{ kg}$

²⁹ $a_{\text{skier}} = 0.57 \text{ m/s}^2$

³⁰ $a = 0.15 \text{ m/s}^2$

³¹ $t_2 = 1.01 \text{ s}$

³² $t_2 = 1.18 \text{ s}$

³³ $a = 5.07 \text{ m/s}^2$

³⁴ $a = 1.75 \text{ m/s}^2$

³⁵ $F_{\text{brake}} = 867 \text{ N}$

³⁶ a. $t = 3.69 \text{ s}$ b. $r = 27.7 \text{ m}$

³⁷ $v_2 = 1.21 \text{ m/s}$

$$^{38} v_{\text{student}} = 1.5 \text{ m/s}$$

$$^{39} \text{Fright rope} = 503 \text{ N}$$

$$^{40} m_{\text{block}} = 116 \text{ kg}$$

$$^{41} m_{\text{block}} = 108 \text{ kg}$$

$$^{42} v_2 = 0.49 \text{ m/s}$$

$$^{43} v_2 = 6.8 \text{ m/s}$$

$$^{44} v_2 = 5.4 \text{ m/s}$$

$$^{45} v_2 = 11 \text{ m/s}$$

$$^{46} v_2 = 1.64 \text{ m/s}$$

$$^{47} \omega_1 = -2.67 \text{ rad/s}$$

$$^{48} \omega_2 = 2.1 \text{ rad/s}$$

$$^{49} R = 2.0 \text{ m}$$

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