

4.4: Selected Answers

¹ $v_3 = 8.83 \text{ m/s}$

² $t_3 = 55.5 \text{ s}$

³ $r_{\text{bmw}} = 51.7 \text{ m}$

⁴ $t_{\text{bmw}} = 30 \text{ s}$

⁵ $v_{\text{bmw}} = 74.1 \text{ m/s}$

⁶ $r_{\text{bmw}} = 71.5 \text{ m}$

⁷ $t_{\text{bmw}} = 2.8 \text{ s}$

⁸ $t = 4.9 \text{ s}$

⁹ $t_3 = 11.6 \text{ s}$

¹⁰ $t_2 = 9.3 \text{ s}$

¹¹ $t_3 = 19.3 \text{ s}$

¹² $r_{\rho} = 2.97 \text{ m}$

¹³ $t_2 = 28.3 \text{ s}$

¹⁴ $\theta_2 = 2.1 \text{ rad}$

¹⁵ $t_2 = 30.2 \text{ s}$

¹⁶ $t_2 = 4.46 \text{ s}$

¹⁷ $v_2 = 28.5 \text{ m/s}$

¹⁸ $\theta_3 = 74.7 \text{ rad}$

¹⁹ $\theta_3 = 68.4 \text{ rad}$

²⁰ $t_3 = 108 \text{ s}$

²¹ $t_4 = 27.8 \text{ s}$

²² $t_3 = 26.2 \text{ s}$

²³ $v_{2B} = 278 \text{ m/s}$

²⁴ $r_{2B} = 950 \text{ m}$

²⁵ $t_4 = 8.96 \text{ s}$

²⁶ $t_3 = 87.1 \text{ s}$

²⁷ a. $v = 14.0 \text{ m/s}$ b. $v = 16.3 \text{ m/s}$

²⁸ a. $\omega = 0.224 \text{ rad/s}$ b. $F = 636 \text{ N}$

²⁹ a. $F = 14.2 \text{ N}$ b. $F = 15.7 \text{ N}$

³⁰ a. $F = 1114 \text{ N}$ b. $F = 1810 \text{ N}$

³¹ $F_{\text{top rope}} = 44 \text{ N}$

³² $\theta = 76.8^\circ$

³³ $v_{\text{max}} = 17.1 \text{ m/s}$

³⁴ $\theta = 5.8^\circ$

³⁵ $v_{\text{max}} = 30 \text{ m/s}$

³⁶ too fast!

³⁷ $\omega_{\text{min}} = 2 \text{ rad/s}$

³⁸ a. $v_2 = 746 \text{ m/s}$ b. $t_3 = 107.7 \text{ s}$

³⁹ a. $v_2 = 194 \text{ m/s}$ b. $t_3 = 27.8 \text{ s}$

⁴⁰ $F_{\text{max}} = 2125 \text{ N}$

⁴¹ $v = 13.7 \text{ m/s}$

⁴² $t = 11.6 \text{ s}$

⁴³ a. $\delta r = 29.4 \text{ m}$ b. $v_2 = 12 \text{ m/s}$

⁴⁴ a. $k = 22.6 \text{ N/m}$ b. $v_2 = 17.9 \text{ m/s}$

⁴⁵ a. $k = 19 \text{ N/m}$ b. $v_2 = 20.6 \text{ m/s}$

⁴⁶ a. $d = 4.8 \text{ m}$ b. $v = 19.8 \text{ m/s}$

⁴⁷ a. $v_2 = 3.87 \text{ m/s}$ b. $\delta r = 3.4 \text{ m}$

⁴⁸ a. $v_2 = 3.91 \text{ m/s}$ b. $s = 2.13 \text{ m}$

⁴⁹ a. $s = 0.19 \text{ m}$ b. $v_2 = 3.27 \text{ m/s}$

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