Chapter 6 Even Answers

2. (a) 1100 N (b) 2.04 times her weight
4. (a) 8.32×10^{-8} N (b) 9.13×10^{22} m/s^2
6. (a) 5.59×10^{3} m/s (b) 239 min (c) 735 N
8. (a) 0.105 m/s (b) 1.10×10^{-2} m/s^2
10. 0.996g
12. (a) (–0.163**i** + 0.233**j**) m/s^2 (b) 6.53 m/s (c) (–0.181**i** + 0.181**j**) m/s^2
14. (a) 149 N (b) 10.4 m/s
16. (a) 1.33 m/s^2 (b) 1.79 m/s^2 at 47.9° inward
18. (a) $v = \sqrt{R\left(\frac{2T}{m} - g\right)}$ (b) $n = 2T$
20. 8.88 N
22. (a) 8.62 m (b) Mg, downward (c) 8.45 m/s^2
24. (a) 3.60 m/s^2 (b) zero (c) Observer in car (non-inertial) claims an 18.0 N force toward the left and an 18.0 N force toward the right. An inertial observer (outside car) claims only an 18.0 N force toward the right.
26. (a) 1.41 h (b) 17.1
28. 93.8 N
30. (a) 6.27 m/s^2 downward (b) 784 N upward (c) 283 N upward
32. (a) 53.8 m/s (b) 148 m
34. 1.40
36. –0.212 m/s^2
40. (a) 0.980 m/s
42. (a) 7.70×10^{-4} kg/m (b) 0.998 N (c) ≈ 49 m, ≈ 6.3 s, ≈ 27 m/s
44. (b) 81.8 m (c) 15.9°
46. (a) 6.67×10^{3} N (b) 20.3 m/s
48. 6.56×10^{15} rev/s
50. $g(\cos\phi \tan\theta - \sin\phi)$
52. (a) $m_2 g$ (b) $m_2 g$ (c) $\sqrt{(m_2/m_1)gR}$
54. 780 N
56. (a) 967 lb (b) -647 lb (pilot must be strapped in)
(c) vary speed and radius of path so that $v^2 = gR$
58. 62.2 rev/min
60. 2.14 rev/min
62. (a) $\sqrt{\pi R g}$ (b) $m\pi g$
64. (a) 8.04 s (b) 379 m/s (c) 1.19×10^{-2} m/s (d) 9.55 cm
66. (a) $v_{\min} = \sqrt{\frac{Rg(\tan\theta - \mu_s)}{1 + \mu_s \tan\theta}}$, $v_{\max} = \sqrt{\frac{Rg(\tan\theta + \mu_s)}{1 - \mu_s \tan\theta}}$ (b) $\mu_s = \tan\theta$
(c) 8.57 m/s ≤ v ≤ 16.6 m/s
68. (a) 0.0132 m/s (b) 1.03 m/s (c) 6.87 m/s
70. (a) 78.3 m/s (b) 11.1 s (c) 121 m