Chapter 2 Even Answers

2. (a) 180 km (b) 63.4 km / h
4. (a) 50.0 m / s (b) 41.0 m / s
6. (a) $2v_1v_2 / (v_1 + v_2)$ (b) 0
8. (a) 27.0 m (b) $x_f = 27.0\text{ m} + (18.0\text{ m/s})\Delta t + (3.00\text{ m/s}^2)(\Delta t)^2$ (c) 18.0 m / s
10. (b) $v_{t=5.0\text{ s}} = 23$ m / s, $v_{t=4.0\text{ s}} = 18$ m / s, $v_{t=3.0\text{ s}} = 14$ m / s, $v_{t=2.0\text{ s}} = 9.0$ m / s (c) 4.6 m / s^2 (d) 0
12. –4.00 m / s^2, sign indicates that acceleration is in negative x direction
14. (a) 20.0 m / s, 5.00 m / s (b) 262 m
16. (c) –4 m / s^2 (d) 34 m (e) 28 m
18. (a) 13.0 m / s (b) 10.0 m / s, 16.0 m / s (c) 6.00 m / s^2 (d) 6.00 m / s^2
20. (f) The spacing of the successive positions would change with less regularity.
22. (a) 5.25 m / s^2 (b) 168 m (c) 52.5 m / s
24. 160 ft
26. (a) 1.87 km (b) 1.46 km
(c) $a_1 = 3.3\text{ m/s}^2$ ($0 \le t \le 15$ s), $a_2 = 0$ ($15\text{ s} \le t \le 40$ s), $a_3 = -5.0\text{ m/s}^2$ ($40\text{ s} \le t \le 50$ s)
(d) (i) $x_1 = (1.67\text{ m/s}^2)t^2$, (ii) $x_2 = (50\text{ m/s})t - 375$ m, (iii) $x_3 = (250\text{ m/s})t - (2.5\text{ m/s}^2)t^2 - 4375$ m
(e) 37.5 m / s
28. (a) 12.7 m / s (b) -2.30 m / s
30. (a) $x = (30.0t - t^2)$ m, $v = (30.0 - 2.00t)$ m / s (b) 225 m
32. 3.10 m / s
34. (a) -4.90×10^5 m / s^2 (b) 3.57×10^{-4} s (c) 18.0 cm
36. 200 m
38. (a) 4.98×10^{-9} s (b) 1.20×10^{15} m / s^2
40. 11.4 s, 212 m
42. \$99.4 / h
44. 1.79 s
46. $\sqrt{gh}$
48. (a) 96.0 ft / s downward (b) 3.07×10^3 ft / s^2 upward (c) 3.13×10^{-2} s
50. (a) 98.0 m / s (b) 490 m
52. 7.96 s
54. (a) $a = -(10.0 \times 10^7\text{ m/s}^3)t + 3.00 \times 10^5\text{ m/s}^2$; $x = -(1.67 \times 10^7\text{ m/s}^3)t^3 + (1.50 \times 10^5\text{ m/s}^2)t^2$
(b) 3.00×10^{-3} s (c) 450 m / s (d) 0.900 m
56. (a) 0.111 s (b) 5.53 m / s
58. 48.0 mm
60. (a) 15.0 s (b) 30.0 m / s (c) 225 m
62. 155 s, 129 s
64. ~ 10^3 m / s^2
66. (a) 26.4 m (b) 6.82%
68. 1.38×10^3 m
70. (c) $\frac{v_{\text{boy}}^2}{h}$, 0 (d) v_{boy}, 0
72. (b) $a = 1.63\text{ m/s}^2$ downward