

ANSWERS

Problem answers are calculated using $g = 9.81 \text{ m/s}^2$ unless otherwise specified in the Problem. Differences in the last figure can easily result from differences in rounding the input data and are not important.

Chapter 1

1. (c)
3. (c)
5. (a)
7. (e)
9. (a) True
(b) False
(c) True
11. 1.19×10^{57}
13. (a) 10^{-8} m
(b) 20 atoms
15. (a) 3×10^{10} diapers
(b) $1.5 \times 10^7 \text{ m}^3$
(c) 0.6 mi^2
17. \$177 M
19. (a) 0.000040 W
(b) 0.000000004 s
(c) 3,000,000 W
(d) 25,000 m
21. (a) C_1 is in m; C_2 is in m/s
(b) C_1 is in m/s²
(c) C_1 is in m/s²
(d) C_1 is in m; C_2 is in s⁻¹
(e) C_1 is in m/s; C_2 is in s⁻¹
23. (a) $4 \times 10^7 \text{ m}$
(b) $6.37 \times 10^6 \text{ m}$
(c) $2.48 \times 10^4 \text{ mi}$; $3.96 \times 10^3 \text{ mi}$
25. 210 cm
27. 1.28 km
29. (a) 36.0 km/h·s
(b) 10.0 m/s²
(c) 88.0 ft/s
(d) 26.8 m/s
31. 4050 m²
33. (a) m/s²
(b) s
(c) m
35. T¹
37. mv^2/r
41. M/L³
43. (a) 30,000
(b) 0.0062
(c) 0.000004
(d) 217,000
45. (a) 1.44×10^5
(b) 2.55×10^{-8}
(c) 8.27×10^3
(d) 6.27×10^2
47. 4×10^6
49. (a) 1.69×10^3
(b) 4.8
(c) 5.6
(d) 10
51. 31.7 y
53. 2.0×10^{23}
55. (a) $1.41 \times 10^{17} \text{ kg/m}^3$
(b) 216 m
57. (a) 4.85×10^{-6} parsec
(b) $3.08 \times 10^6 \text{ m}$
(c) $9.47 \times 10^{15} \text{ m}$
(d) $6.33 \times 10^4 \text{ AU}$
(e) 3.25 c·y
59. The claim is conservative as the actual weight of water used is closer to 55,000 tons.
61. (a) $n = 3/2$; $C = 17.0 \text{ y}/(\text{Gm})^{3/2}$
(b) 0.510 Gm
63. $1.16 \times 10^{19} \text{ lb}$

Chapter 2

1. 0
3. It is safer to land against the wind.
5. (a) Negative
(b) During the last five steps, gradually slow the speed of walking, until the wall is reached.

