Practice F, p. 105

1. 0 m/s
3. 3.90 m/s at $(4.0 \times 10^1)°$ north of east

3 Review, pp. 108–113

7. **a.** 5.20 m at 60.0° above the positive x-axis
   b. 3.00 m at 30.0° below the positive x-axis
   c. 3.00 m at 150° counterclockwise from the positive x-axis
   d. 5.20 m at 60.0° below the positive x-axis
9. 15.3 m at 58.4° south of east
19. if the vector is oriented at 45° from the axes
21. **a.** 5 blocks at 53° north of east
    b. 13 blocks
23. 61.8 m at 76.0° S of E (or S of W), 25.0 m at 53.1° S of E (or S of W)
25. 2.81 km east, 1.31 km north
31. 45.1 m/s
33. 11 m
35. **a.** clears the goal by 1 m
    b. falling
37. 80 m; 210 m
41. **a.** 70 m/s east
    b. 20 m/s
43. **a.** 10.1 m/s at 8.53° east of north
    b. 48.8 m
45. 7.5 min
47. **a.** 41.7 m/s
    b. 3.81 s
    c. $v_{y,f} = -13.5$ m/s, $v_{x,f} = 34.2$ m/s, $v_f = 36.7$ m/s
49. 10.5 m/s
51. **a.** 2.66 m/s
    b. 0.64 m
53. 157 km

55. **a.** 32.5 m
    b. 1.78 s
57. **a.** 57.7 km/h at 60.0° west of the vertical
    b. 28.8 km/h straight down
59. 18 m; 7.9 m
61. 6.19 m/s downfield

CHAPTER 4

Practice B, p. 128

1. $F_x = 60.6$ N; $F_y = 35.0$ N
3. 557 N at 35.7° west of north

Practice C, p. 132

1. 2.2 m/s^2 forward
3. 4.50 m/s^2 to the east
5. 14 N

Practice D, p. 139

1. 0.23
3. **a.** 8.7×10^2 N, 6.7×10^2 N
   b. 1.1×10^2 N, 84 N
   c. 1×10^3 N, 5×10^2 N
   d. 5 N, 2 N

Practice E, p. 141

1. 2.7 m/s^2 in the positive x direction
3. **a.** 0.061
   b. 3.61 m/s^2 down the ramp

4 Review, pp. 145–149

11. **a.** $\mathbf{F_1}$ (220 N) and $\mathbf{F_2}$ (114 N) both point right; $\mathbf{F_1}$ (220 N) points left, and $\mathbf{F_2}$ (114 N) points right.
    b. first situation: 220 N to the right, 114 N to the right; second situation: 220 N to the left, 114 N to the right
21. 55 N to the right

29. 51 N
35. 0.70, 0.60
37. 0.816
39. 1.0 m/s^2
41. 13 N down the incline
43. 64 N upward
45. **a.** 0.25 m/s^2 forward
    b. 18 m
    c. 3.0 m/s
47. **a.** 2 s
    b. The box will never move. The force exerted is not enough to overcome friction.
49. -1.2 m/s^2; 0.12
51. **a.** 2690 N forward
    b. 699 N forward
53. 13 N, 13 N, 0 N, -26 N

CHAPTER 5

Practice A, p. 162

1. 1.50×10^7 J
3. 1.6×10^3

Practice B, p. 166

1. 1.7×10^2 m/s
3. the bullet with the greater mass; 2 to 1
5. 1.6×10^3 kg

Practice C, p. 168

1. 7.8 m
3. 5.1 m

Practice D, p. 172

1. 3.3 J
3. **a.** 785 J
   b. 105 J
   c. 0.00 J

Practice E, p. 177

1. 20.7 m/s
3. 14.1 m/s
5. 0.18 m