1. A bird, accelerating from rest at a constant rate, experiences a displacement of 28 m in 11 s. What is the average velocity?
2. A railroad train travels forward along a straight track at 80.0 m/s for 1 000 m and then travels at 50.0 m/s for the next 1 000 m. What is the average velocity?
3. A European sports car dealer claims that his car will accelerate at a constant rate from rest to 100 km/hr in 8.00 s. If so, what is the acceleration?
4. A rock is thrown straight down with an initial velocity of 14.5 m/s from a cliff. What is the rock’s displacement after 2.0 s? (Acceleration due to gravity is 9.80 m/s2.)
5. A rock is thrown straight up with an initial velocity of 24.5 m/s.What maximum height will the rock reach before starting to fall downward? (Take acceleration due to gravity as 9.80 m/s2.)
6. A rock is thrown straight up with an initial velocity of 19.6 m/s. What time interval elapses between the rock’s being thrown and its return to the original launch point? (Acceleration due to gravity is 9.80 m/s2.)
7. Two objects of different mass are released simultaneously from the top of a 20-m tower and fall to the ground. If air resistance is negligible, which statement best applies?
8. A baseball catcher throws a ball vertically upward and catches it in the same spot when it returns to his mitt. At what point in the ball’s path does it experience zero velocity and non zero acceleration at the same time?
9. A baseball is released at rest from the top of the Washington Monument. It hits the ground after falling for 6.0 s. What was the height from which the ball was dropped? (g = 9.8 m/s2 and assume air resistance is negligible)
10. A rock, released at rest from the top of a tower, hits the ground after 1.5 s. What is the speed of the rock as it hits the ground? (g = 9.8 m/s2 and air resistance is negligible)
11. Omar throws a rock down with speed 12 m/s from the top of a tower. The rock hits the ground after 2.0 s. What is the height of the tower? (air resistance is negligible)
12. Gwen releases a rock at rest from the top of a 40-m tower. If g = 9.8 m/s2 and air resistance is negligible, what is the speed of the rock as it hits the ground?
13. John throws a rock down with speed 14 m/s from the top of a 30-m tower. If g = 9.8 m/s2 and air resistance is negligible, what is the rock’s speed just as it hits the ground?
14. Human reaction time is usually about 0.20 s. If your lab partner holds a ruler between your finger and thumb and releases it without warning, how far can you expect the ruler to fall before you catch it? The nearest value is:
15. Mt. Everest is more than 8 000 m high. How fast would an object be moving if it could free fall to sea level after being released from an 8000-m elevation? (Ignore air resistance.)