

### **Assessment p 53; 51, 54, 62**

50. Light from the Sun reaches Earth in 8.3 min. The speed of light is  $3 \times 10^8$  m/s. How far is Earth from the Sun?

51 . A car is moving down a street at 55 km/h. A child suddenly runs into the street. If it takes the driver 0.75 s to react and apply the brakes, how many meters will the car have moved before it begins to slow down?

62. You plan a car trip for which you want to average 90 km/h. You cover the first half of the distance at an average speed of only 48 km/h. What must your average speed be in the second half of the trip to meet your goal? Is this reasonable?

Note that the velocities are based on half the distance, not half the time.

### **Practice Problems p64; 6, 7, 9,**

6. A race car's velocity increases from 4.0 m/s to 36 m/s over a 4.0-s time interval. What is its average acceleration?

7. The race car in the previous problem slows from 36 m/s to 15 m/s over 3.0 s. What is its average acceleration?

9. A bus is moving at 25 m/s when the driver steps on the brakes and brings the bus to a stop in 3.0 s.

a. What is the average acceleration of the bus while braking?

b. If the bus took twice as long to stop, how would the acceleration compare with what you found in part a?

**p65; 18ab, 19, 20, 21**

18. A golf ball rolls up a hill toward a miniature-golf hole. Assume that the direction toward the hole is positive.

- a. If the golf ball starts with a speed of 2.0 m/s and slows at a constant rate of  $0.50 \text{ m/s}^2$ , what is its velocity after 2.0 s?
  
- b. What is the golf ball's velocity if the constant acceleration continues for 6.0 s?

19. A bus that is traveling at 30.0 km/h speeds up at a constant rate of  $3.5 \text{ m/s}^2$ . What velocity does it reach 6.8 s later?

20. If a car accelerates from rest at a constant  $5.5 \text{ m/s}^2$ , how long will it take for the car to reach a velocity of 28 m/s?

21. A car slows from 22 m/s to 3.0 m/s at a constant rate of  $2.1 \text{ m/s}^2$ . How many seconds are required before the car is traveling at 3.0 m/s?

**Practice Problems p69; 26, 27, 28, 29**

26. A skateboarder is moving at a constant velocity of 1.75 m/s when she starts up an incline that causes her to slow down with a constant acceleration of  $-0.20 \text{ m/s}^2$ . How much time passes from when she begins to slow down until she begins to move back down the incline?

27. A race car travels on a racetrack at 44 m/s and slows at a constant rate to a velocity of 22 m/s over 11 s. How far does it move during this time?

28. A car accelerates at a constant rate from 15 m/s to 25 m/s while it travels a distance of 125 m. How long does it take to achieve this speed?

29. A bike rider pedals with constant acceleration to reach a velocity of 7.5 m/s over a time of 4.5 s. During the period of acceleration, the bike's displacement is 19 m. What was the initial velocity of the bike?

80. Find the uniform acceleration that causes a car's velocity to change from 32 m/s to 96 m/s in an 8.0 s period.

81. A car with a velocity of 22 m/s is accelerated uniformly at the rate of  $1.6 \text{ m/s}^2$  for 6.8 s. What is its final velocity?

88. A dragster starting from rest accelerates at  $49 \text{ m/s}^2$ . How fast is it going when it has traveled  $325 \text{ m}$ ?

90. A race car can be slowed with a constant acceleration of  $-11 \text{ m/s}^2$ .  
a. If the car is going  $55 \text{ m/s}$ , how many meters will it travel before it stops?  
b. How many meters will it take to stop a car going twice as fast?

93. How far does a plane fly in  $15 \text{ s}$  while its velocity is changing from  $145 \text{ m/s}$  to  $75 \text{ m/s}$  at a uniform rate of acceleration?