Name _____ **Date** _____
Teacher _____ **Period** _____

Acceleration and Free Fall Worksheet

1. A golf ball rolls up a hill toward a miniature-golf hole. Assign the direction toward the hole as being positive.
   a. If the ball starts with a speed of 4.0 m/s and slows at a constant rate of -0.50 m/s^2, what is its velocity after 3.0 s?

   b. If the constant acceleration continues for 10.0 s, what will be its velocity then?

   c. Describe the motion of the golf ball during the six seconds.

2. A bus, traveling at 35.0 km/h, speeds up at a constant rate of 3.5 m/s^2. What velocity does it reach 7.0 s later?

3. If a car accelerates from rest at a constant 5.5 m/s^2, how long will it need to reach a velocity of 42 m/s?

4. A car slows from 22 m/s to 3.0 m/s at a constant rate of 3.5 m/s^2. How many seconds are required before the car is traveling at 3.0 m/s?

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

6. A car accelerates at a constant rate from 12 m/s to 27 m/s while it travels 125 m. How long does it take to achieve this speed?

7. A bike rider accelerates constantly to a velocity of 9.5 m/s during 3.5 s. The bike's displacement during the acceleration was 22 m. What was the initial velocity of the bike?

8. An airplane starts from rest and accelerates at a constant 4.50 m/s^2 for 35.0 s before leaving the ground.
   a. How far did it move?

   b. How fast was it going when it took off?

9. A brick is dropped from a high scaffold.
   a. What is its velocity after 4.5 s?

   b. How far does the brick fall during this time?

10. A tennis ball is thrown straight up with an initial speed of 20.5 m/s. It is caught at the same distance above ground as it was thrown.
   a. How high does the ball rise?

   b. How long does it take for the ball to reach its maximum height?