**More 1-Dimensional Motion Practice Problems—word problems**

1. A football is thrown vertically up in the air at 10 m/s. If it is later caught at the same spot it was thrown from, will the speed be greater than, less than, or the same as when it was thrown?
2. Can an object be increasing in speed as the magnitude of its acceleration decreases?  Explain and provide an example.
3. A baseball is moving at a speed of 40.0 m/s toward a baseball player, who swings his bat at it. The ball stays in contact with the bat for $5.00 \times 10^{-4}$ seconds, then moves in essentially the opposite direction at a speed of 45.0 m/s.  What is the magnitude of the ball's average acceleration over the time of contact? (These figures are good estimates for a professional baseball pitcher and batter.)
4. A car is driven for 2.0 hours at 40.0 km/hr, then for another 2.0 hours at 60.0 km/hr in the same direction.
    a. What is the car's average velocity?
    b. What is the car's displacement?
5. A race car can be slowed with a constant acceleration of -11 m/s$^2$.
    a. If the car is going 55 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?
    c. How fast is the second car traveling in miles/hour?
6. How far does a plane fly in 15 s while its velocity is changing from 145 m/s to 75 m/s at a uniform rate of acceleration?
7. A truck is stopped at a stoplight.  When the light turns green, the truck accelerates at 2.5 m/s2. At the same instant, a car passes the truck going 15 m/s.  Where and when does the truck catch up with the car?
8. A helicopter is rising at 5.0 m/s when a bag of its cargo is dropped.  The bag falls for 2.0 s.
    a. What is the bag's velocity at 2.0 s?
    b. How far has the bag fallen?
    c. How far below the helicopter is the bag?
9. The brochure advertising a sports car states that the car can be moving at 100.0 km/h, and stop in 37.19 meters. What is its average acceleration during a stop from that velocity? Express your answer in m/s$^2$. Consider the car's initial velocity to be a positive quantity.
10. A croissant is dropped from the top of the Eiffel Tower. The height of the tower is 300.5 meters (ignoring the antenna, and this figure changes slightly with temperature). Ignoring air resistance, at what speed will the croissant be traveling when it hits the ground?
11. You stand near the edge of Half Dome in Yosemite, reach your arm over the railing, and (thoughtlessly, since what goes up does come down and there are people below) throw a rock upward at 8.00 m/s. Half Dome is 1460 meters high. How long does it take for the rock to reach the ground? Ignore air resistance.
12. A ball is thrown vertically upward from the ground with an initial speed of 15.0 m/s.  *(From college text.)*
    a. How long does it take the ball to reach its maximum altitude?

b. What is its maximum altitude?
c. Determine the velocity and acceleration of the ball at t = 2.00 s.