***Free Fall Extra Practice***

1. An object is tossed into the air. As it rises, what happens to the acceleration of the object?

2. A 10 [kg] object is dropped from rest.

a. How far will it drop in 2 [s]?

b. How long will it take a 5 [kg] object to drop the same distance?

3. An object is dropped from rest from the top of a 100 [m] building. How long will it take for the object to hit the ground?

5. A cliff diver from the top of a 100 [m] cliff. He begins his dive by jumping up with a velocity of 5 [m/s].

a. How long does it take for him to hit the water below?

b. What is his velocity right before he hits the water?

6. Alan Iverson slam dunks a basketball and a physics student observes that Iverson’s feet are 1 [m] above the floor at his peak height. At what upward velocity must Iverson leave the floor to achieve this?

7. A bullet is shot vertically into the air with a velocity of +450 [m/s]. Neglecting air resistance,

a. How long is the bullet in the air?

b. How high does the bullet go?

8. A sandbag is dropped from a hot air balloon that is 300 [m] above the ground and rising at a rate of 13 [m/s].

a. How long does it take for the sandbag to hit the ground?

b. How fast is the sand bag going when it hits the ground?

c. At what height is the balloon when the sand bag hits the ground? (Remember that the balloon is rising at a constant rate while the sand bag is in the air.)