Freefall Worksheet 1

Part One: At the top of your paper, write out the value for the acceleration due to gravity, and both freefall equations.

Acceleration due to Gravity:	Freefall Equation 1:	Freefall Equation 2:

Part Two: Show all of your work in FGES format <u>on a separate sheet of paper</u>. For all of the following questions, assume that you can ignore air resistance. Just giving answers at this point in the year is unacceptable and will earn you a zero. <u>No FGES = no grade</u>.

1. A penny dropped into a wishing well reaches the bottom in 1.50 seconds. What was the velocity at impact?
2. A pitcher threw a baseball straight up at 35.8 meters per second. What was the ball's velocity after 2.50 seconds?
3. In a bizarre but harmless accident, a watermelon fell from the top of the Eiffel Tower. How fast was the watermelon traveling when it hit the ground 7.80 seconds after falling?
4. A water balloon was dropped from a high window and struck its target 1.1 seconds later. If the balloon left the person's hand at -5.0 meters per second, what was its velocity on impact?
5. A stone tumbles into a mine shaft and strikes bottom after falling for 4.2 seconds. How deep is the mine shaft?
6. A boy threw a small bundle toward his girlfriend on a balcony 10. meters above him. The bundle stopped rising in 1.5 seconds. How high did the bundle travel? Was that high enough for her to catch it?
7. At about 55 meters per second, a falling parachuter (before the parachute opens) no longer accelerates. Air friction opposes acceleration. Imagine that the parachutist is freely falling until he reaches that terminal velocity of 55 m/s. How long would that take?
8. The climber dropped her compass at the end of her 240-meter climb. How long did it take to strike bottom?
9. On a hot summer day several swimmers decide to jump into a river.They step off the bridge and strike the water 1.5 s later. Ignore air resistance.
    a. What is the height of the bridge?
    b. How fast are the swimmers moving when they strike the water?
10. Assume a bridge is about 60 meters above the water.
    a. How long would it take for a rock dropped from the bridge to reach the water?
    b. How fast would the rock be moving as it entered the water?