UNIT III: Worksheet 2

For each of the following problems write the fundamental mathematical model to use, rearrange it to the form required to solve the problem, then solve the problem. Be sure to label appropriately.

1. A student drops a pumpkin off the top of a very tall building. Find:	2. Repeat question 1 for a pumpkin falling on the moon. The acceleration due to gravity there is -1.7 m/s^2.
a. its displacement at t = 3s	
b. the time for it to reach a speed of -25 m/s	
c. the time required for it to fall -300 m	
d. its velocity after falling -70 m	

3. A ball is dropped from rest at a height of 80 m above the ground.
   a.   How long does it take for it to reach the ground?

   b.   What is its speed just as it hits the ground?

4. A marble dropped from a bridge strikes the water in 6.0 s. Calculate:
   a. the velocity with which it strikes the water

   b. the height of the bridge

5. Now the student gives the pumpkin an initial velocity of -20 m/s. What is the:
   a. acceleration of the object

   b. displacement after 4 s

   c. time required to reach a velocity of -50 m/s

6. When a kid *drops* a rock off the edge of a cliff, it takes 4.0 s to reach the ground below. When he *throws* the rock down, it strikes the ground in 3.0 s. What initial speed did he give the rock? *Hint: This is a two step problem.*