

Name _____

Period _____ Date _____

UNIT VI: WORKSHEET 1

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 body falls freely from rest on Earth. Find:
 - a. its displacement at $t = 3\text{s}$
 - 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 speed after falling 70 m
2. Repeat question 1 for a body falling freely on the moon. The acceleration due to gravity there is 1.7 m/s^2 .
3. A ball is dropped from rest at a height of 80 m above the ground.
 - a. What is its speed just as it hits the ground?
 - b. How long does it take for it to reach the ground?
4. A marble dropped from a bridge strikes the water in 6.0 s . Calculate:
 - a. the speed with which it strikes the water
 - b. the height of the bridge

Free Fall with $v_i \neq 0$

5. A body is thrown downward with an initial speed of 20 m/s on Earth. What is the:
 - a. acceleration of the object
 - b. displacement after 4 s
 - c. time required to reach a speed of 50 m/s
 - d. time required to fall 300 m (Hint: factor the quadratic)
 - e. speed after falling 100 m
6. A student throws his worthless lab partner off a 120 m high bridge with an initial downward speed of 10 m/s
 - a. How long does it take the deadbeat to hit the ground below?
 - b. How fast is he going at the moment of impact?
7. 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?