2A.3 Level 3 #2 FREE FALL PROBLEM SET

Name:   Date:

**Hang Time Activity**

(1) Using a meter stick, measure and record your vertical leap.

(2) At what point do you enter free fall?

(3) Are you at rest when you first enter free fall or are you moving?

(4) Read page 22 of *Conceptual Physics.*

(5) On page 22, they find half the hang time for Spud Webb. What

equation do they start with?

(6) This equation is identical with one of the equations used in

class, except the variables have different names. Which equation

from class is it?

(7) What is your hang time? Show all of your steps using the GUESS

Process.

(8) Complete problems below. Draw motion maps for each.

1. A robot probe drops a camera off the rim of a 239 m high cliff on Mars, where the free-fall acceleration

is -3.7 m/s2.

1. Find the velocity with which the camera hits the ground.
2. Find the time required for it to hit the ground.

2. A flowerpot falls from a windowsill 25.0 m above the sidewalk.

a. How fast is the flowerpot moving when it strikes the ground?

b. How much time does a passerby on the sidewalk below have to move out of the way before the flowerpot hits the ground?

3. A tennis ball is thrown vertically upward with an initial velocity of +8.0 m/s.

a. What will the ball’s speed be when it returns to its starting point?

b. How long will the ball take to reach its starting point?

4. Calculate the displacement of a volleyball that is thrown upward with an initial velocity of 6.0 m/s and the final velocity is 1.1 m/s upward.

46. A parachutist descending at a speed of 10.0 m/s loses a shoe at an altitude of 50.0 m.

a. When does the shoe reach the ground?

b. What is the velocity of the shoe just before it hits the ground?

Level 4 #5: pp. 70-71, #32 and #36.