

HIP 03

COMMENTS:

- Problem 1 will be graded based off of the HIP rubric.
- Problem 2 is a list of suggested Student Workbook Volume 1 problems to practice in your spare time. You do not need to turn these in, they will not be graded.

(1) An astronaut shipwrecked on a distant planet with unknown characteristics is on top of a cliff, which she wishes to descend. She does not know the acceleration due to gravity on the planet, and she has only a good watch with which to make measurements. She wants to learn the height of the cliff, and to do this she makes two measurements. First, she lets the rock fall from the rest off the cliff edge; she finds that the rock takes 2.54 seconds to reach the distant ground below the cliff. Second, she releases the rock from the same spot at the top of the cliff but tosses it upwards so that it rises 2 meters before falling to the distant ground below the cliff. This time the rock takes 3.77 seconds to reach the ground after she initially let go of the rock. What is the height of the cliff?

a. Hints:

- i. Break this problem into 2 parts. One part for dropping the rock, and one for tossing the rock in the air.
- ii. When working on the problem, do not think about trying to solve for the height, try to build multiple equations identifying your knowns and unknowns before you begin to plug any one equation into the other.
- iii. For tossing the rock in the air, consider building a set of equations using more than one time interval.

(2) CH 2: 21, 22, 23, 24, 25