

Physics 151 Worksheet #2: 1-D Kinematics with Acceleration

Name: _____

Partner(s): _____

Directions : Complete the following questions based on the computer simulation. Please show all of your work and explain all of your reasoning. Place a box around your final answer.

Simulation #1: Balloon & Cargo

a) What is the velocity of the cargo before the rope is cut?

b) At what instant does the cargo reach its maximum height? Calculate t and compare it to what you measure in the animation (to the nearest 0.05 s).

c) What is the maximum height (relative to the ground) reached by the cargo? Calculate this height and compare it to what you measure in the animation.

d) Calculate the instantaneous velocity of the cargo at the instant (just before) it hits the ground..

Simulation #2: Putting Uphill

a) What should the minimum initial velocity of the ball be in order to make it into the hole located at $x = -3.6 \text{ m}$? (Show all work and explain all procedures fully.)

Simulation #3: Tennis Ball Cannon

a) If you want the red ball to return to the launcher at the same instant that the green ball hits the ground, what should the red tennis ball's initial velocity be? (Show all work and explain all procedures fully.)

b) With the initial velocity you calculated in part (a), what would be the maximum height of the red ball shot from the launcher?