**Motion Practice #3: Acceleration and Free Fall**

***INSTRUCTIONS****: Complete the following problems in your journal! Show your process clearly and include proper units throughout calculations for every problem!*

1. Donna accelerates her car from the metered ramp onto the freeway.
   1. If Donna’s car goes from rest (0 mi/hr) to 60. mi/hr in 10. seconds, what is the value of the acceleration of the car? Express in both mi/hr2AND m/s2.
   2. How far, in meters, did Donna’s car travel during the above acceleration?
2. Rory is pushing Amy in a wheelbarrow race. Good times! If Rory goes from rest to 3.2 m/s in 6.0 seconds accelerating uniformly:
   * 1. What was Rory’s average speed?
     2. How far did Rory push Amy during the 6 seconds?
     3. What was their acceleration?
3. Clara goes hiking and wants to know how high she is above a canyon. She carefully drops a rock off a ledge. It takes 6.0 seconds to reach the bottom of the canyon.
   1. How high is the canyon?
4. Assuming no air resistance, what was the acceleration of the rock as it fell?
5. What is the instantaneous speed, in m/s, of the rock just as it hits the ground?
6. Jack throws a baseball straight up in the air as hard as he can! It takes 4.0 seconds to reach the top of its path.
   1. What was the speed, in m/s, of the ball as Jack released it?
   2. How high did the ball go?
   3. What was the instantaneous velocity of the ball at the top of its path?
   4. What was the acceleration of the ball at the top of its path?
   5. Create a quantitative *v-t* graph (use graph paper) for the ball for the upward motion (make upward be a positive velocity).

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