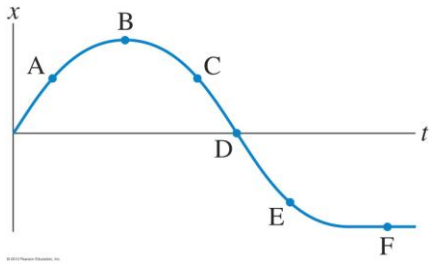
Quiz 2
Phys 220
Fall 2012

Names: _____

Be sure to show work or support your answer for every problem.

1. You're shown in the text that you can safely bet a friend that if you drop a dollar bill they cannot catch it without moving their hand. This is based on a reaction time of 0.25s. However, most of the class was able to catch the bill. The question is "Would this be a safe bet on the moon?"
    a. Determine the reaction time on Earth for catching a bill which is ~6 inches in length. Use -9.8 m/s^2 for the acceleration due to Earth's gravity.
    b. Use the reaction time you found in a. to calculate how far something will drop during that time on the moon. The gravity on the moon is 1/6 of that on Earth.

2. The figure to the right shows a position-versus-time graph. At which lettered point or points is the object
    a. Moving the fastest?
    b. Moving to the left?
    c. Speeding up?
    d. Slowing down?
    e. Turning around?



3. Draw the velocity-versus-time and acceleration-versus-time graphs directly below the position-versus-time graph. Be sure that the three graphs correspond (use a dotted line to show where points of interest line up.

$v = \frac{\Delta x}{\Delta t} = \frac{x_f - x_i}{\Delta t}$ $a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{\Delta t}$ 2.54 cm = 1 inch 100 cm = 1 m

$x_f = x_i + v_i \Delta t + \frac{1}{2} a(\Delta t)^2$ $v_f = v_i + at$ $v_f^2 = v_i^2 + 2a(\Delta x)$

4. A ball is thrown straight up from the ground at a rate of 29.4 m/s and falls into a hole 9.00 m below where it starts.
    a. What is its velocity the instant before it hits the bottom of the hole?
    b. How long does it take from release for the ball to pass its original position on the way down?
    c. What is the ball's maximum height?
    d. What is the ball's velocity and acceleration at its maximum height?