

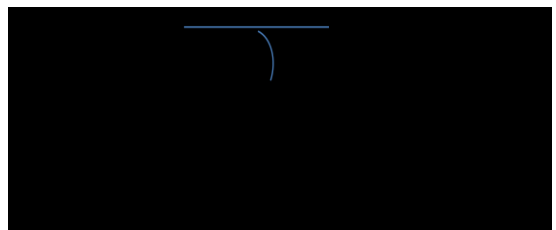
Quiz 2
Phys 220 - Spring 2014

Names: _____

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

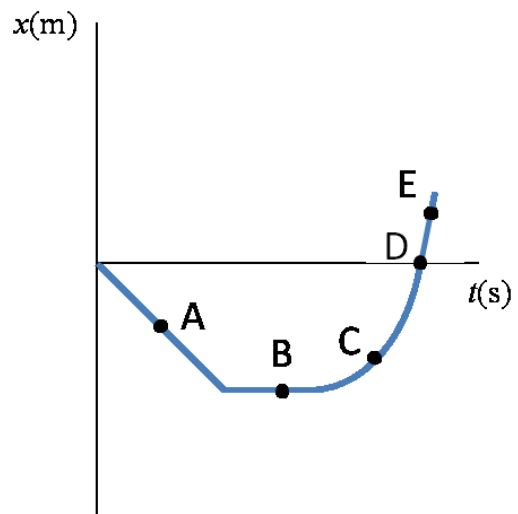
1. The text suggests betting your friend they can't catch a \$20 bill. (Warning: air resistance might actually cause you to lose that bet!) On Mars there's no atmosphere so a \$20 bill wouldn't have the air resistance problem it would here on Earth. So "Would it be a safe bet on Mars?"
 - a. Determine the reaction time on Earth for catching a ruler 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 Mars. The gravity on Mars is 38% of that on Earth.

2. A person walks 2.0 blocks East, 1.0 block North and then 4.0 blocks 30° South of East. What is the magnitude of their total displacement?



3. The figure to the right shows a position-versus-time graph. At which lettered point or points is the object

- Moving the fastest?
- Moving to the left?
- Stationary
- Speeding up?
- Turning around?



4. 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.)

5. A ball is thrown straight up from the ground at a rate of 29.4 m/s and falls into a hole 10.0 m below where it starts.
- What is its velocity the instant before it hits the bottom of the hole?
 - How long does it take from release for the ball to pass its original position on the way down?
 - What is the ball's maximum height?
 - What is the ball's velocity and acceleration at its maximum height?

$$v = \frac{\Delta x}{\Delta t} = \frac{x_f - x_i}{\Delta t}$$

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

$$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{\Delta t}$$

$$v_f = v_i + at$$

$$2.54 \text{ cm} = 1 \text{ inch}$$

$$100 \text{ cm} = 1 \text{ m}$$

$$v_f^2 = v_i^2 + 2a(\Delta x)$$