Physics 220 - Exam #I
Fall 2011

Name: _____

1. Scientific theories can always be proven correct through a reasonable amount of experimentation, if they are indeed correct.
   a. True
   b. False

2. If an object has a positive velocity and a negative acceleration, it means the object will
   a. slow down.
   b. speed up.
   c. slow down, turn around and speed up in the other direction
   d. remain at a constant speed

3. When a ball is thrown up into the air, what is its acceleration at the top of its flight?
   a. $a = 0\ m/s^2$
   b. $a = -9.8\ m/s^2$
   c. $a = 9.8\ m/s^2$
   d. not enough information is given.

4. What does the slope of this graph represent?
   a. Position
   b. Velocity
   c. Acceleration

5. Use dimensional analysis to verify that the equation $a = \Delta x/\Delta t$ could be correct.

6. Sketch the corresponding velocity vs. time and acceleration vs. time graphs for the graph in #4.

7. A train travels at a constant speed of 100 m/s for 3 days and then returns to its original destination at 70 m/s.
   a. How long does the return trip take?
   b. What is the train's average velocity for the entire trip out and back?

8. If a cannon is fired on a flat plane at an angle of 20^o above the horizontal with an initial velocity of 25 m/s,
   a. how long is it in the air? and
   b. what is its range?

1 mile = 1609 meters 1 kilometer = 0.621 miles 100 centimeters = 1 meter

1 hour = 3600 seconds 1 day = 24 hours

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

$\sin\theta$ = opp/hyp $\cos\theta$ = adj/hyp $\tan\theta$ = opp/adj $\vec{g} = -9.8 m/s^2$ $a^2 + b^2 = c^2$