Topic 1 Study Guide

I. Things to memorize. The first question on the test will be a blank space where you will be asked to reproduce the following information from memory.

A. Units:

Quantity	SI Unit
distance (x)	meters (m)
time (t)	seconds (s)
velocity (v)	m/s
acceleration (a)	m/s^2

B. Definitions:

- Velocity - the rate at which a given distance is increasing (or decreasing)
  - Average velocity $v = \frac{\Delta x}{\Delta t}$
  - Instantaneous velocity $v = \frac{dx}{dt}$
- Acceleration - the rate at which velocity is increasing (or decreasing). $a = \frac{\Delta v}{\Delta t}$.

e.g. $v_i = 12\ m/s$, $a = 5\ m/s^2$

time (s)	0	1	2	3	4
v (m/s)	12	17	22	27	32

C. Equations:

The distance an object will travel under constant acceleration is given by $\Delta x = v_i t + \frac{1}{2}at^2$.

II. Proofs. The second question on the test will ask you to prove the result $\Delta x = v_i t + \frac{1}{2}at^2$. There is more than one valid answer here - see the lecture.

III. Problem solving. There will be 1 or 2 questions directly from the HW and 1 or 2 original questions.