Honors Physics:
1st Semester Exam: Review Material

Basic Outline:

- *50 Multiple Choice Questions
  - Scantron
  - 30 Concept Questions
  - 20 Mathematics Questions
- 1 Page Free Response

Basic Ideas:

- Units for Variables
- Definitions of Key Variables or Terms
- Recognition of key theorems or formulas

Mathematical Toolkit (6 Questions):

- Sig Figs
- Trig
- Vectors
  - Adding and Subtracting Vectors Visually
  - Converting Polar to Rectangular Coordinates
  - Converting Rectangular to Polar Coordinates
  - Components

Kinematics in One-Dimension (8 Questions):

- Vectors vs. Scalars
  - Distance vs. Displacement
  - Speed vs. Velocity
- Kinematic Equations
- Graphical Analysis (the 'Snowman')
  - Slope of a Position vs. Time Graph
  - Slope of a Velocity vs. Time Graph
  - Area under an Acceleration vs. Time
  - Area under a Velocity vs. Time Graph
  - Concavity (Concave up and Concave down)
- Gravity and Free Fall

Kinematics in Two-Dimensions (Projectiles) (5 Questions):

- Definition of Projectile Motion
- Assumptions of Projectile Motion
  - Only acceleration due to gravity
  - No acceleration in the x-direction
  - Constant velocity in the x-direction
  - No initial y-velocity for a ½ projectile
  - Time is the same whether measured in the x- or y-direction
- ½ Projectile
- Full Projectile

Forces (8 Questions):

- Mass and Inertia
- Newton's Three Laws of Motion
- Free Body Diagrams
- Equilibrium vs. Non-Equilibrium
- Finding the ΣF
- Mass vs. Weight
- Masses on an Incline
- Forces Studied
    - Normal Force
    - Force of Gravity
    - Force of Friction (Static and Kinetic)
        - Be able to differentiate between the two

Work, Power and Energy (7 Questions):

- Work
- Power
- Energy
    - Work-Energy Theorem
    - Kinetic and Potential Energy
    - Conservation of Energy

Impulse, Momentum, and Collisions (7 Questions):

- Impulse
- Momentum
- Impulse Momentum Theory
- Conservation of Momentum
- Collisions
    - Elastic, Inelastic, and Total Inelastic

***Other General Questions (9)**