

RAA01 – Checklist of things to know/review

**RAA01 Contains all information from lectures up to and including lecture 07: 1-D kinematics. Below is a short list of important concepts to understand. The goal of this list is to help you organize your thoughts as you study. This sheet does not contain everything that we covered, just the highlights to help point you in the right direction.*

- Dimensions:
 - Mass [M] ; Length [L], Time [T]
 - Dimensional analysis:
 - Find dimensions of physical quantity given an equation or written description of equation.
- SI base units:
 - Mass measured in kilograms; length measured in meters; time measured in seconds.
 - Unit conversions.
- Order of magnitude:
 - Definition?
 - Estimates, approximations.
- Significant figures.
 - Be able to identify the proper significant figure value to answer a problem with if given multiple different sig figs. (e.g. if given 2.22 1.2 and 1.033, the final answer after some algebraic manipulation should be only 2 sig figs).
- Scientific notation.
- Prefix:
 - giga= ____ ; mega= ____ ; kilo = ____ ; centi = ____ ; milli = ____ ; micro = ____ ; nano = ____ ;
- Vectors:
 - Vector addition:
 - Graphical methods, and mathematical component form.
 - Vector subtraction:
 - Graphical methods, and mathematical component form.
 - Cartesian to polar (i.e. Cartesian component form to magnitude and direction).
- Position vector
- Displacement vector
- Distance
- Average velocity
- Instantaneous velocity
 - Tangent to trajectory at a specific time.
- Speed
- Average acceleration
- Motion diagrams.
 - Be able to draw motion diagrams from a written description of a scenario. Also be able to describe a possible scenario if given a motion diagram.
- Graphical analysis

- Are you comfortable with going between x -vs- t , v_x -vs- t , and a_x -vs- t graphs? Can you answer questions like what is the displacement between a time interval if you are given the v_x -vs- t graph?
- Be able to sketch to reasonable scale two of the graphs if given the third (e.g. if given a_x -vs- t , sketch the x -vs- t and v_x -vs- t graphs making sure that each graph is reasonably scaled like the warm up question we covered during Wednesday's lecture).
- Physical representations
 - Be sure to include: basic sketch of situation, at least 2 locations, labeled velocity vectors at the locations you chose, acceleration vector, label a horizontal or vertical distance that may be important, and a coordinate system.
- 1-D kinematics
 - Have you memorized the 3 kinematic equations?
 - Must include the physical representation.
 - Must write down and start with the most general equation and show which quantities go where. (i.e. start with one or more of the 3 kinematic equations in variable form, then plug in your knowns and simplify/solve).