

I. Laws, Principles, and Theorems

Recognize these by name, know the main ideas involved, the kind of situations where applicable, etc.

Principle of superposition (*i.e.*, the independence of horizontal and vertical motion for projectiles)
Newton's Second Law of motion.

II. Other Concepts, Terms, etc.

Define them, know what they mean, their applications, and other interesting things about them. (Sometimes we define things by use of equations, in which case you will need to know what the equations mean and how to apply them.) Know all about ...

SI (mks) units

displacement, average speed & velocity, instantaneous speed & velocity

motion diagrams

motion graphs and how to interpret their slopes (BOTH x vs. t AND v vs. t plots!)

uniform motion, uniformly accelerated motion

turning points of motion

acceleration, average acceleration, instantaneous acceleration (in 1, 2, and 3 dimensions)

vectors and scalars

Cartesian unit vectors, $\hat{i}, \hat{j}, \hat{k}$

free-fall and g (gravitational field strength)

concepts underlying projectile motion; independence of horizontal and vertical motion; acceleration; forces

trajectory (parabolic for projectiles)

horizontal range of projectiles

launch angle of projectiles

uniform circular motion

centripetal acceleration

absolute and relative uncertainties

inertia & mass

free-body diagrams (simple ones)

forces: weight (the force of gravity), tension (what is our simple model of tension in a string, cable?)

the differences between force, weight, mass, Newtons ($N \equiv \text{kg m/s}^2$), kilograms, and acceleration

III. Other Topics for Discussion, Problem-solving, etc.

unit conversion

particle model

pictorial representation of motion

how is the velocity vector related to the path (trajectory)?

significant figures

know when and how to use the equations of constant acceleration (Table 2-1)

[I will give you these equations!]

adding vectors (using both the graphical and component methods)

the magnitude of a vector when given in component form

resolving vectors into components (decomposition) and vice versa

know how to propagate uncertainties through simple calculations

(*i.e.*, addition/subtraction & multiplication/division)

the basics of tension, T (*i.e.*, T same everywhere for non-stretching, "massless" rope, & T same throughout a given rope for mass-less, frictionless pulleys)

IV. Equations

Know how to apply them to above cases! I will provide you with all necessary equations except those on the **Know Sheet**. Make sure you know the notation (symbols) and the units for the physical quantities we've discussed!