

Physics 112 – I Can Statements

Unit I – Kinematics

___ I can explain the difference between vectors and scalars and give examples.

$d-t$ graphs – I can . . .

___ Read displacement and time from the graph.

___ Determine distance from the graph.

___ Determine instantaneous and average velocity, instantaneous and average speed from the graph

$v-t$ graphs – I can . . .

___ Read instantaneous velocity and time from the graph.

___ Determine acceleration from the graph.

___ Determine distance and displacement from the graph.

___ Determine instantaneous and average speed from the graph.

Vector Addition – I can . . .

___ understand and use the tip-to-tail method of vector addition in 1 and 2 dimensions.

___ solve 1-dimensional vector addition problems.

___ give directions in two dimensions using bearings or compass directions (e.g. N20°E).

___ solve 2-dimensional vector addition problems including straight vector addition, and average velocity and speed.

Motion – Problem Solving – I can . . .

___ recite the kinematics equations

___ use kinematics equations to solve 1 dimensional motion problems.

Unit II – Dynamics

Friction – I can . . .

- ___ understand the terms *normal force*, *force of friction*, *net force* and *coefficient of friction*.
- ___ relate the normal force and force of friction to the coefficient of friction and use this relation to solve problems.
- ___ can determine the normal force and force of friction when pulling horizontally or at an angle at constant velocity.

Newtons' Laws – I can . . .

- ___ understand and state Newton's 3 laws of motion and apply them to physical situations.
- ___ draw free body diagrams illustrating the forces on objects.
- ___ break a force vector into perpendicular components.
- ___ take a word problem and set up the appropriate free body diagram(s) to represent the situation.
- ___ use 2nd law and force diagrams to determine the net force and acceleration of an object, or use the acceleration to determine the net force.
- ___ find the acceleration of multiple objects connected together.
- ___ find the tension in a rope.
- ___ solve problems involving pulleys and understand that pulleys simply change the direction of the force.