

Mr. Jenkins  
Physics I

## Assignment Sheet Vectors and Projectile Motion

### Objectives

You will be able to:

- A. Add vectors using graphical (head-to-tail) and component methods.  
Use the Pythagorean Theorem and sine, cosine, and tangent functions to determine the components of a vector.  
Use the Pythagorean Theorem and inverse sine, inverse cosine, and inverse tangent functions to determine the magnitude and direction of a resultant vector by the component method.
- B. Apply vector addition to solve relative velocity problems.
- C. Explain the concept and consequence of being able to consider horizontal and vertical motions independently and the use of superposition of the directions to determine the motion of a projectile.  
Sketch/draw an x-y graph of position for a projectile.  
Explain how the components of the velocity vector change during the motion of a projectile.  
Explain qualitatively how air resistance would affect the flight of a projectile.

### Reading

- A. 3-1, Scalars vs. Vectors, p. 58  
3-2, The Components of a Vector, p. 58–62  
3-3, Adding and Subtracting Vectors, p. 63–66  
H2.01 Trigonometry for Physics
- B. 3-6, Relative Motion, p. 71–74  
Relative Motion video  
Frames of Reference video
- C. 4-1, Motion in Two Dimensions, p. 81–86  
4-2, Projectiles Motion: Basic Equations, p. 86–88  
4-3, Zero Launch Angle, p. 88–92  
4-4, General Launch Angle, p. 92–95  
4-5, Projectile Motion: Key Characteristics, p. 96–100

### Written Homework ***Study notes and read text nightly***

Assignments as necessary to support class work and reading (as given on board and website)

### Focus Questions:

1. Explain the concept of relative motion as it relates to airplane flight. Include long distance flights and the jet stream and landing with a crosswind.
2. Write an annotated guide to solving 2D motion problems including the x-y chart ( $\Delta x$ ,  $\Delta y$ ,  $v_x$ ,  $v_y$ , etc.)