**Chapter 3 - Two dimensional motion and vectors:**

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| **Vectors:**  **Finding Components:**  1. Draw components from tail to tip  Use arrows for components  2. Find the length of the sides:  θ  hyp  opp  adj  opp = hyp Sin(θ)  adj = hyp Cos(θ)  3. Decide x or y, + or -  (+, +)  (+, -)  (-, +)  (-, -)  4. Write it as units x + units y  **Adding two component vectors:**  A = 1 m x + 2 m y  B = 2 m x + 3 m y  A+B = 3 m x + 5 m y  (Add x to x and y to y)  **Converting Components to Angle Magnitude:**  1. Draw the vector  Draw x, and from there draw y as arrows  The vector goes from the tail of the x to the tip of the y  4.0 m  3.0 m  θ  mag.  e.g. 3.0 m x + -4.0 m y:      2. Find the angle using Tan-1  3. Find the magnitude using the Pythagorean theorem | **Projectile Motion:**    Fill in given, solve. Time is shared by both sides  **Cliff Problems:**  Purely horizontal initial velocity, so Vi vertical = 0  **Arc Problems:**  1. Break launch velocity into components  2. Fill in H/V table  3. For level range remember vertical Vf = -Vi  4. To get greatest height remember vertical Vf at top = 0  **Boat Crossing River:**  1. Fill this in:    Solve. Time is shared by both sides.  **Range Equation:**    e.g. v2/9.8\*sin(2\*angle)  ,  e.g. sin-1(9.8\*range/v2)/2 |