

Physics Notes - mathematical vector addition, vector components

$$\sin = O/H$$

$$\cos = A/H$$

$\tan = O/A$ where O = opposite, A = adjacent, H = hypotenuse

Example 1: if a steel ball is dropped near a magnet, it accelerates at 270 degrees and 10 m/s^2 and at 180 degrees and 3 m/s^2 - What is the resultant acceleration ?

Two vectors can be added to make one (the resultant).

One vector can be divided into two (or more) vector's. We usually divide a vector into

perpendicular and parallel components.

We use vector components because sometimes only one component needs to be considered,

Example 2: Tug of war revisited; If two people pull on a rope ($10,000 \text{ N}$ force) as shown (30 degrees from 180 each and perpendicular to a third person), what force is needed by the third person to equilibrate the other two people ? (hint add components parallel to third person)

Example 3: What is the horizontal component of a baseball's velocity if the bat is swung at 15 degrees 100 mph ? (what do you need to assume/know ?)

We can add vectors at any angle using trig. /components but it gets more complex.