**Pythagorean (and Tangent) or the Law of Cosine (and the Law of Sine)?**

**When you are doing vector additions that form triangles it is important to figure out what technique you need to use.**

**If the vectors form a “right” triangle you can use Pythagorean and the trig Function Tangent.**

**Example: 3.5 N @ 90 degrees + 5.5 N @ 180 degrees, what’s the resultant?**

**5.5 N**

**3.5 N**

**R**

**theta**

**\*\*Since this is a “right triangle” Pythagorean and Tangent can be used.**

**R2 = 5.52 + 3.52**

**R = 6.519 N @ ??**

**\*\*You can also use the Trig function Tangent (Tangent = Opposite / Adjacent) to find the angle of the Resultant.**

**Tan = 5.5 / 3.5**

**Theta = Inverse Tangent of 1.57 = 57.5**

**R = 6.519 N @ 57.5 degrees.**

**If the vector addition does not form a right triangle then you need to use the Law of Cosine and the Law of Sine.**

**Example:**

**10.5 m/s @ 45 degrees + 15.5 m/s @ 105 degrees, what’s the resultant?**

**15.5 m/s**

**10.5 m/s**

**1st Find angle “c”.**

**2nd Find the magnitude using the Law of Cosine.**

**3rd Find the angle of the resultant using the Law of Sine.**