Adding Non – Linear

Vectors.

Often when two objects (or forces) interact they do so on different planes.

In a lot of situations a negative, positive, right or left direction cannot be given to the resultant.

In these cases the Navigation System is used which uses degrees based on the relative position of the things interacting.

The direction when using this system can range from 0 degrees to 360 degrees.

Example: Wind blowing 20 m/s @ 45 degrees.

 90

 180 0

 270 45

**Using these steps that you used to draw a linear vector addition to scale (using a protractor) you can do the same to find the resultant of a non – linear vector addition.**

1. **Make a scale that allows you to draw the 1st vector (example 10 m/s = 1 cm).**
2. **Using a protractor and pencil, draw an arrow the correct length at the correct angle.**
3. **Draw the second vector using a new reference line.**
4. **Draw a straight line from starting point to ending point to represent the “resultant”.**
5. **Measure the length and angle. Convert your answer to standard units.**

**Example: If an airplane is traveling 70 m/s @ 50 degrees and the wind is blowing 35 m/s at 80 degrees, what will the resultant be?**

**Scale: 1 cm = 10 m/s**

 0

 60 80

 0

 50

**Resultant 10.8 cm = 108 m/s @ 60 degrees.**

Resultant is always from the starting point to the ending point. The direction is always from the original reference point.