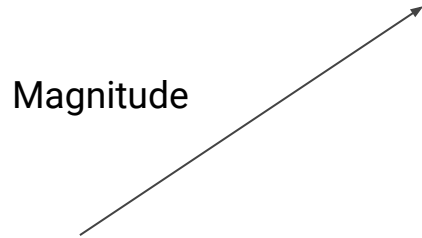


VECTORS

VECTOR

A vector is a quantities which are fully defined by both magnitude and directions



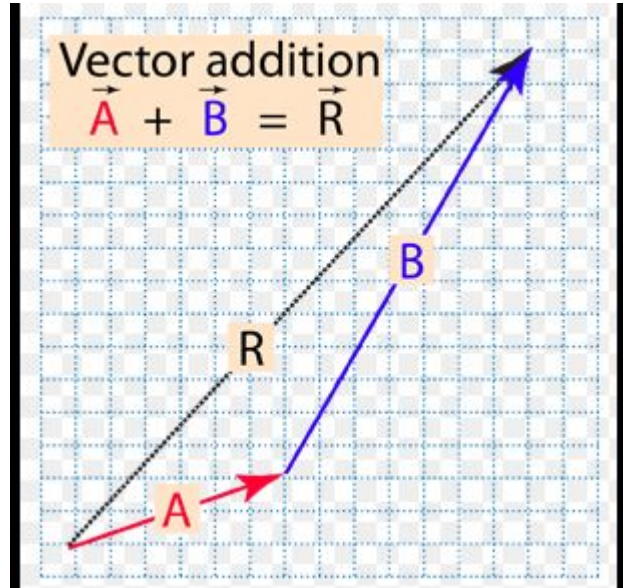
Types of vectors

1. Unit vector - Vector with magnitude one(1)
2. Co- initial vector - Vectors having same point of origin
3. Collinear vectors - vectors that are parallel to each other
4. Equal vectors -vectors that are equal in magnitude and directions
5. Negative vector - Vectors having equal magnitude but opposite direction



Vector operations

Vector addition:



Dot product:

$$\begin{aligned}a &= \underline{3}i + \underline{4}j & b &= \underline{5}i - \underline{2}j \\a &= a_x i + a_y j & b &= b_x i + b_y j \\a \cdot b &= a_x b_x + a_y b_y \\&= 3(5) + 4(-2) \\&= 15 - 8 = 7\end{aligned}$$

Cross product :

$$a = 3i + 5j - 7k$$

$$b = 2i - 6j + 4k$$

$$a \times b = \begin{vmatrix} i & j & k \\ 3 & 5 & -7 \\ 2 & -6 & 4 \end{vmatrix}$$

$$= i \begin{vmatrix} 5 & -7 \\ -6 & 4 \end{vmatrix} - j \begin{vmatrix} 3 & -7 \\ 2 & 4 \end{vmatrix} + k \begin{vmatrix} 3 & 5 \\ 2 & -6 \end{vmatrix}$$