magnitude property of a vector

(i) $|V| \geq 0$, and $|V| = 0$ iff $V = 0$

$|cV| = |c||V|$

$|u| = 1$ is called unit vector

Ratio formula

$$r = \frac{qa + pb}{p + q}$$

If P is the mid pt of AB

then $p : q = 1 : 1$

$$r = \frac{a + b}{2}$$

vector space

$R^3 = \{(x, y, z) = x, y, z \in R$

vector plane

$R^2 = \{(x, y) : x, y \in R\}$

magnitude of vector space

$|u| = \sqrt{x^2 + y^2 + z^2}$

(i) $u + v = v + u$ (commutative law)

(ii) $(u+v) + w = u + (v+w)$ Associative law

(iii) $u - u = 0$ inverse

(iv) $\alpha(u+v) = \alpha u + \alpha v$ Distributive law

(v) $a(bu) = (ab)u$ Scalar multi

Distance b/w two point space

$$|P_1P_2| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$