



① V. F.
 $\vec{r} = \vec{a} + \lambda\vec{b}$

② C. F.
 $\frac{x-x_1}{a} = \frac{y-y_1}{b} = \frac{z-z_1}{c}$

e.g. $\frac{2x+1}{3} = \frac{y-2}{5} = \frac{z}{4}$

$\frac{2(x+\frac{1}{2})}{3} = \frac{y-2}{5} = \frac{z-0}{4}$

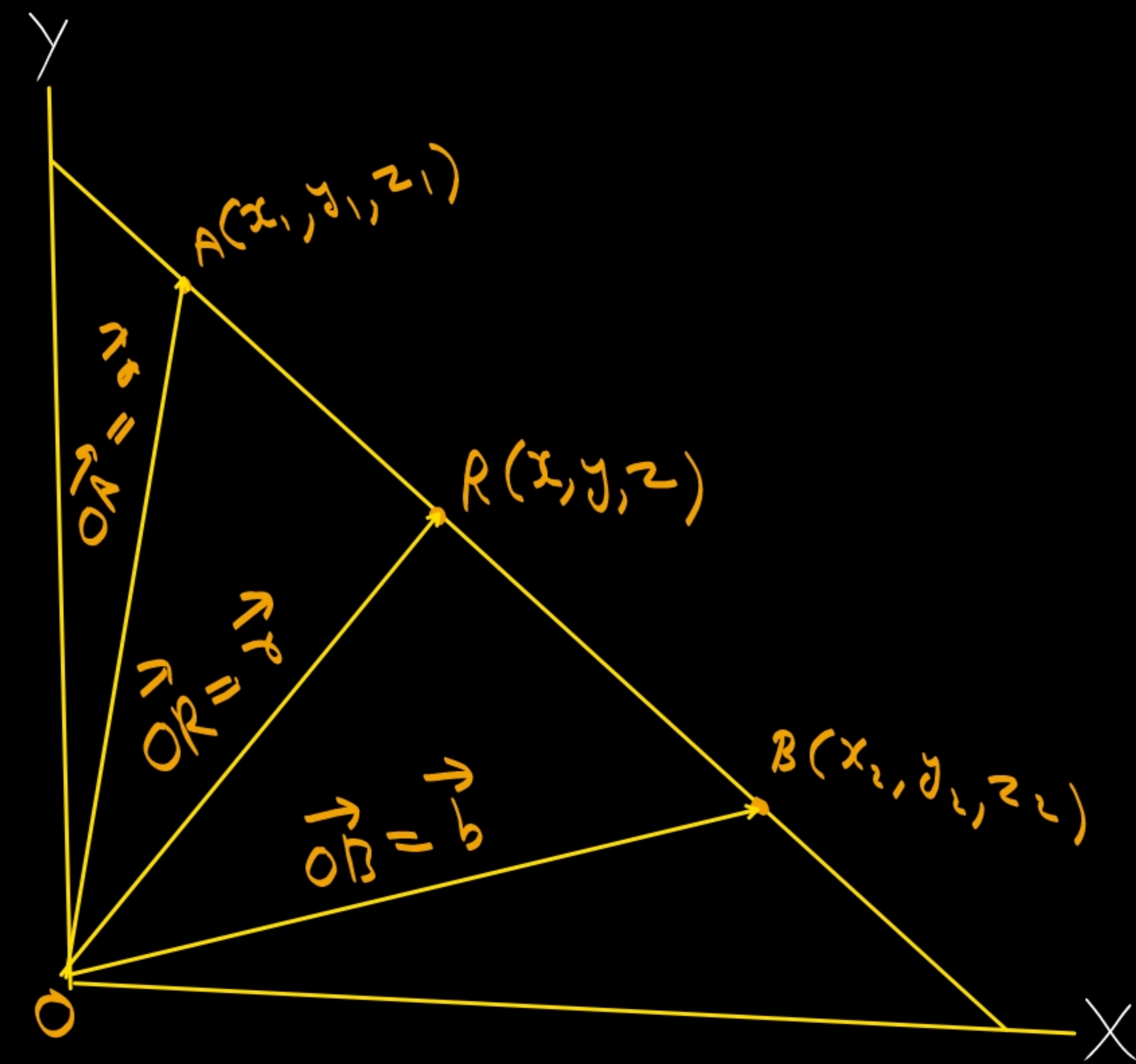
$\frac{x - (-\frac{1}{2})}{\frac{3}{2}} = \frac{y-2}{5} = \frac{z-0}{4}$

$\vec{b} = \frac{3}{2}\hat{i} + 5\hat{j} + 4\hat{k}$

A $(-\frac{1}{2}, 2, 0)$

e.g. $\frac{1-2x}{5} = \frac{1+y}{2} = \frac{z+1}{-4}$

दो दिए गए बिंदुओं से जाने वाली रेखा की समीकरण



\vec{AR} व \vec{AB} संरखें।

$$\vec{AR} = \lambda \vec{AB}$$

$$\vec{r} - \vec{a} = \lambda (\vec{b} - \vec{a})$$

$$\vec{r} = \vec{a} + \lambda (\vec{b} - \vec{a}) \quad \text{V.F.}$$

$$x\hat{i} + y\hat{j} + z\hat{k} = (x_1\hat{i} + y_1\hat{j} + z_1\hat{k}) + \lambda [(x_2 - x_1)\hat{i} + (y_2 - y_1)\hat{j} + (z_2 - z_1)\hat{k}]$$

$$x\hat{i} + y\hat{j} + z\hat{k} = x_1\hat{i} + y_1\hat{j} + z_1\hat{k} + \lambda(x_2 - x_1)\hat{i} + \lambda(y_2 - y_1)\hat{j} + \lambda(z_2 - z_1)\hat{k}$$

$$x\hat{i} + y\hat{j} + z\hat{k} = [x_1 + \lambda(x_2 - x_1)]\hat{i} + [y_1 + \lambda(y_2 - y_1)]\hat{j} + [z_1 + \lambda(z_2 - z_1)]\hat{k}$$

$$x = x_1 + \lambda(x_2 - x_1), \quad y = y_1 + \lambda(y_2 - y_1), \quad z = z_1 + \lambda(z_2 - z_1)$$

$$\frac{x - x_1}{x_2 - x_1} = \lambda; \quad \frac{y - y_1}{y_2 - y_1} = \lambda; \quad \frac{z - z_1}{z_2 - z_1} = \lambda$$

$$\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1}$$

C.F.

e.g. बिंदुओं $(-1, 0, 2)$ और $(3, 4, 6)$ से होकर जाने वाली रेखा का सदिश समीकरण है.

$$A(-1, 0, 2) \quad B(3, 4, 6)$$

$$\vec{a} = -\hat{i} + 2\hat{k} \quad \vec{b} = 3\hat{i} + 4\hat{j} + 6\hat{k}$$

$$\vec{r} = \vec{a} + \lambda(\vec{b} - \vec{a}) \quad \text{V.F.}$$

$$\vec{r} = (-\hat{i} + 2\hat{k}) + \lambda(4\hat{i} + 4\hat{j} + 4\hat{k})$$

$$\vec{r} = (-\hat{i} + 2\hat{k}) + 4\lambda(\hat{i} + \hat{j} + \hat{k})$$

$$\vec{r} = (-\hat{i} + 2\hat{k}) + \lambda'(\hat{i} + \hat{j} + \hat{k})$$

where $\lambda' = 4\lambda, \lambda \in \mathbb{R}$.

e.g. 8

$$\frac{x+3}{2} = \frac{y-5}{4} = \frac{z+6}{2}$$

$$\rightarrow \frac{x-(-3)}{2} = \frac{y-5}{4} = \frac{z-(-6)}{2}$$

$$\vec{b} = 2\hat{i} + 4\hat{j} + 2\hat{k}$$

$$\vec{a} = -3\hat{i} + 5\hat{j} - 6\hat{k}$$

V.F.

$$\vec{r} = \vec{a} + \lambda\vec{b}$$

$$\vec{r} = (-3\hat{i} + 5\hat{j} - 6\hat{k}) + \lambda(2\hat{i} + 4\hat{j} + 2\hat{k})$$