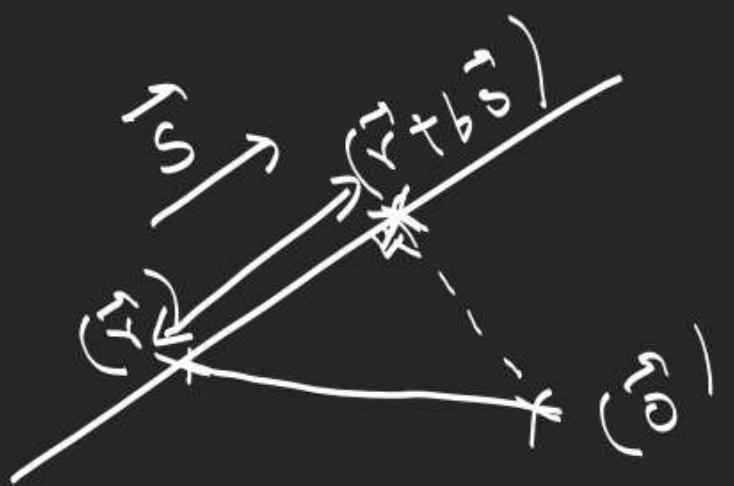


$$\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c} \Rightarrow -$$

$$x - y + 2z = 0$$

$$x^2 + y^2 + z^2 = 12$$



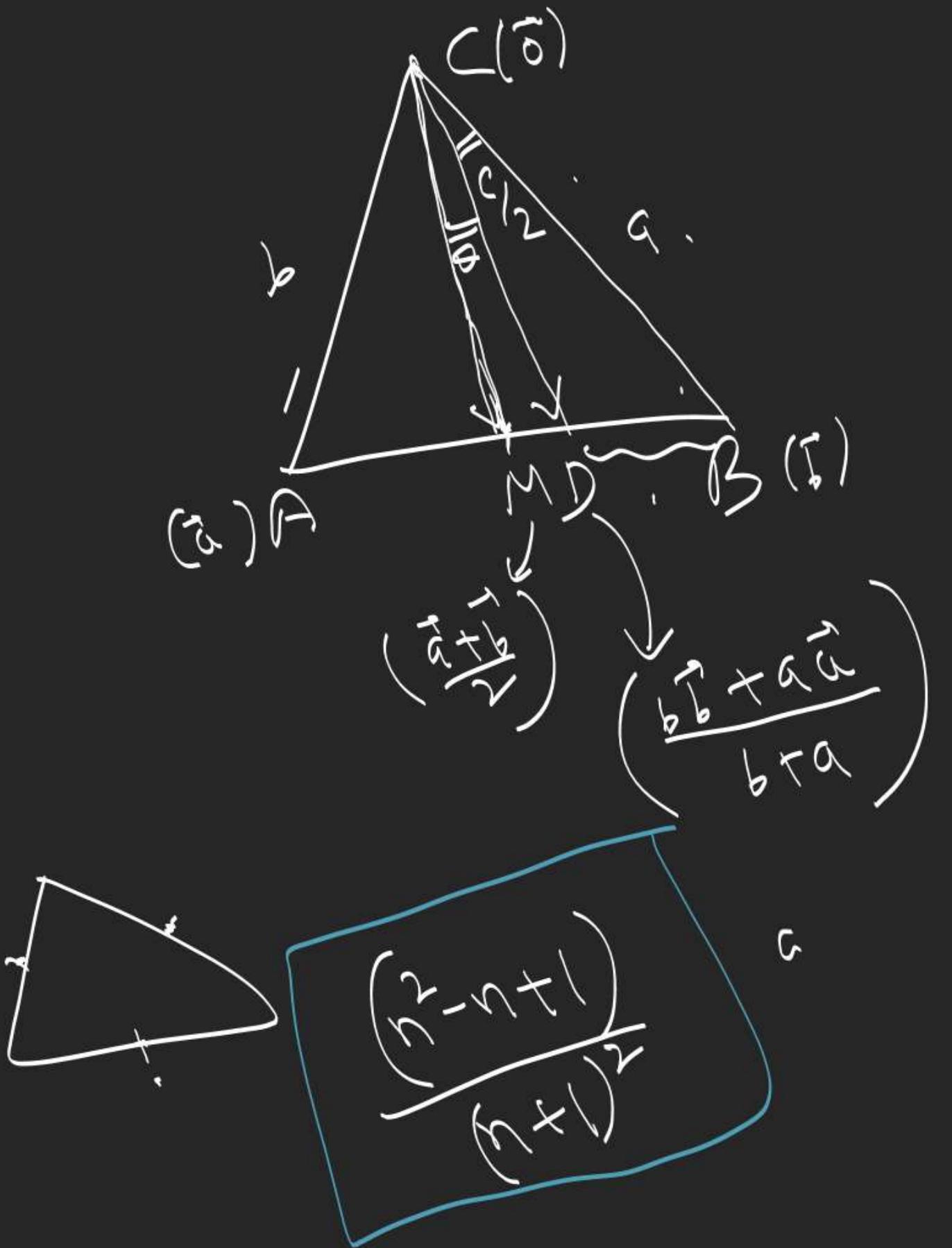
$$x, y, z = ?$$

$\gamma < 0$

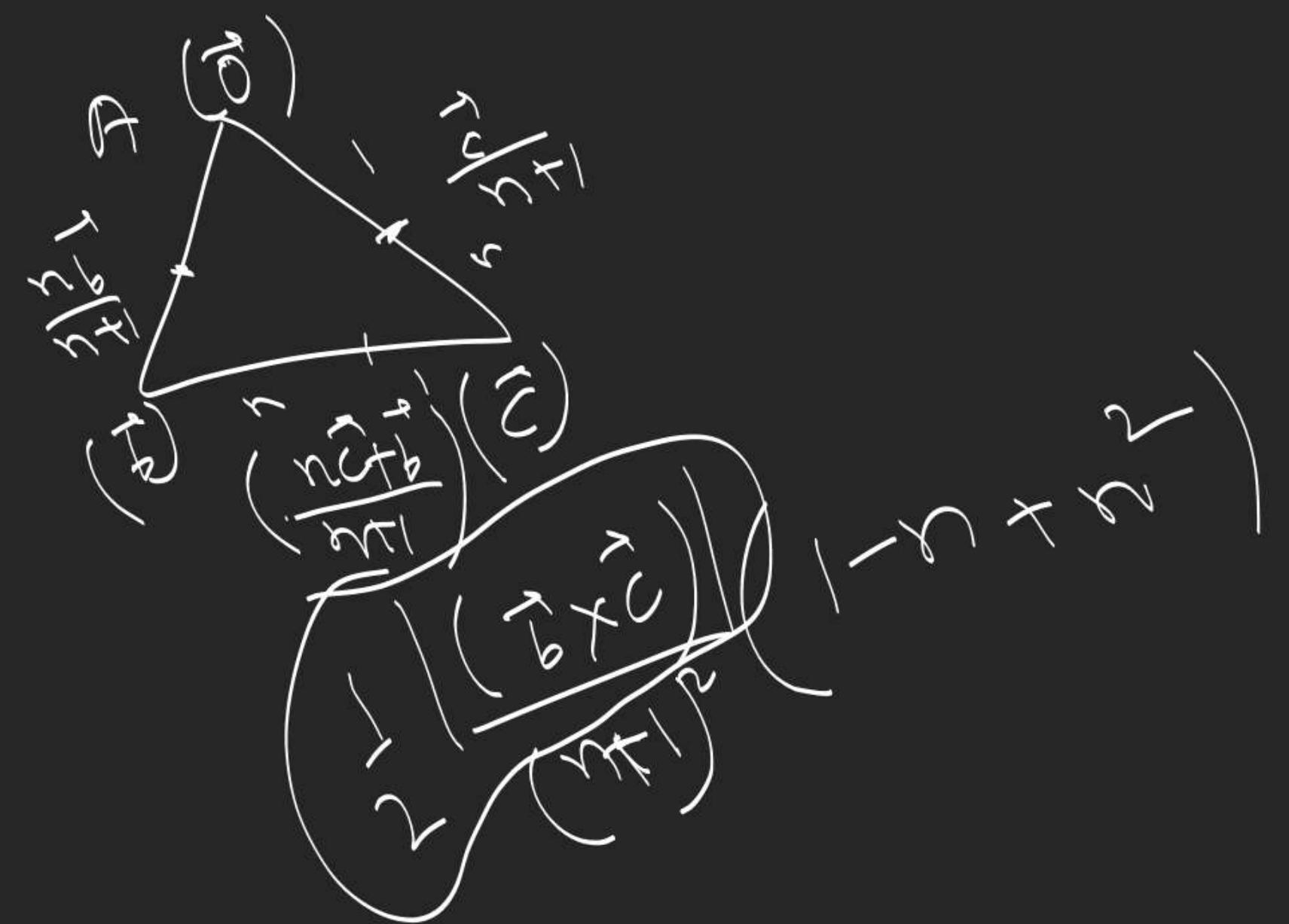


$$\vec{u} = \left| \frac{\vec{u}}{2} \right| \hat{i} + \left| \frac{\vec{u}}{2} \right| \sqrt{3} \hat{j}$$

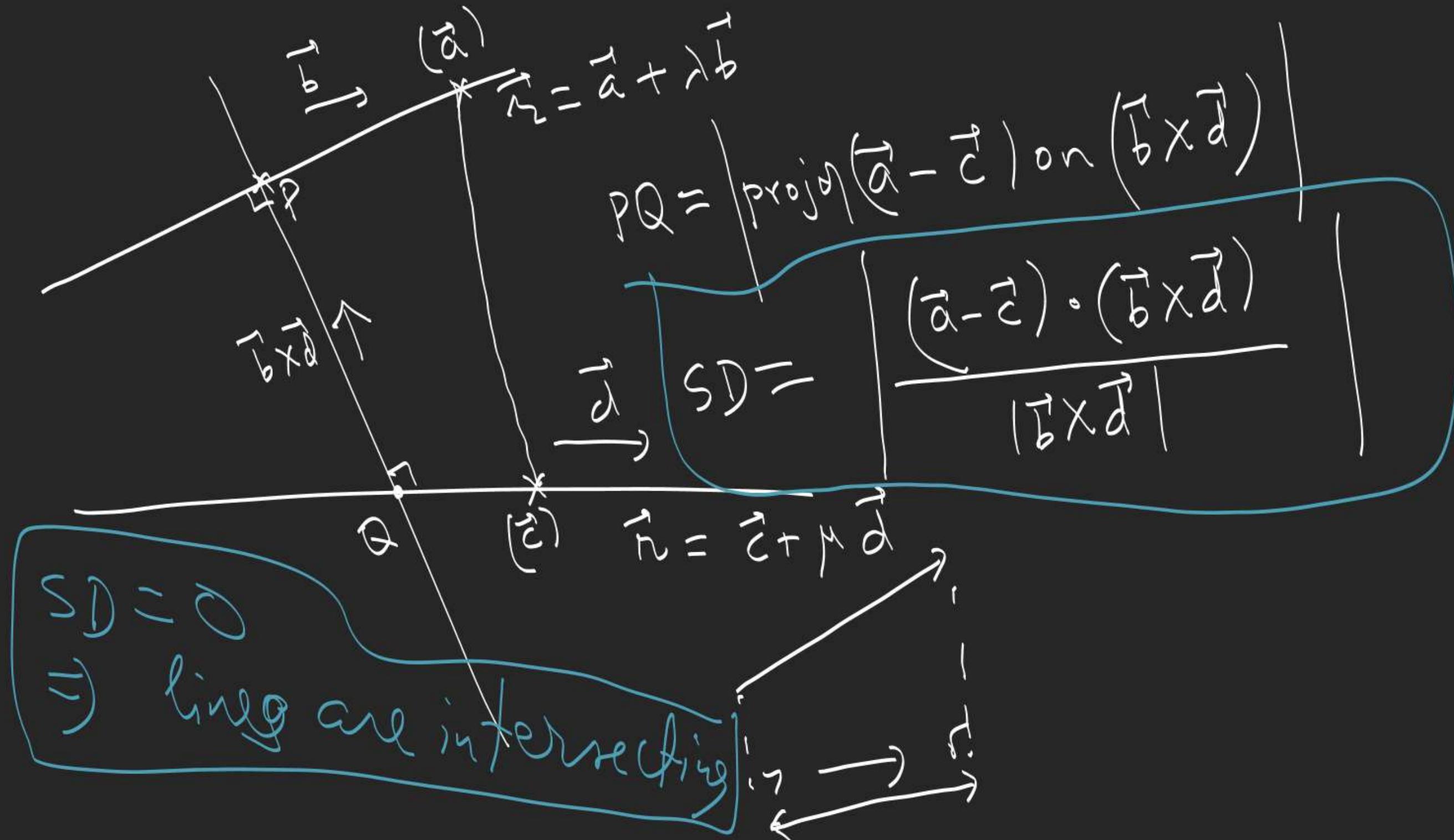
$$\left| \vec{u} \right|^2 = \left(\left(\frac{\left| \vec{u} \right|}{2} - 2 \right)^2 + \left(\frac{\left| \vec{u} \right| \sqrt{3}}{2} \right)^2 \right) \left(\left(\frac{\left| \vec{u} \right|}{2} - 1 \right)^2 + \left(\frac{\left| \vec{u} \right| \sqrt{3}}{2} \right)^2 \right)$$

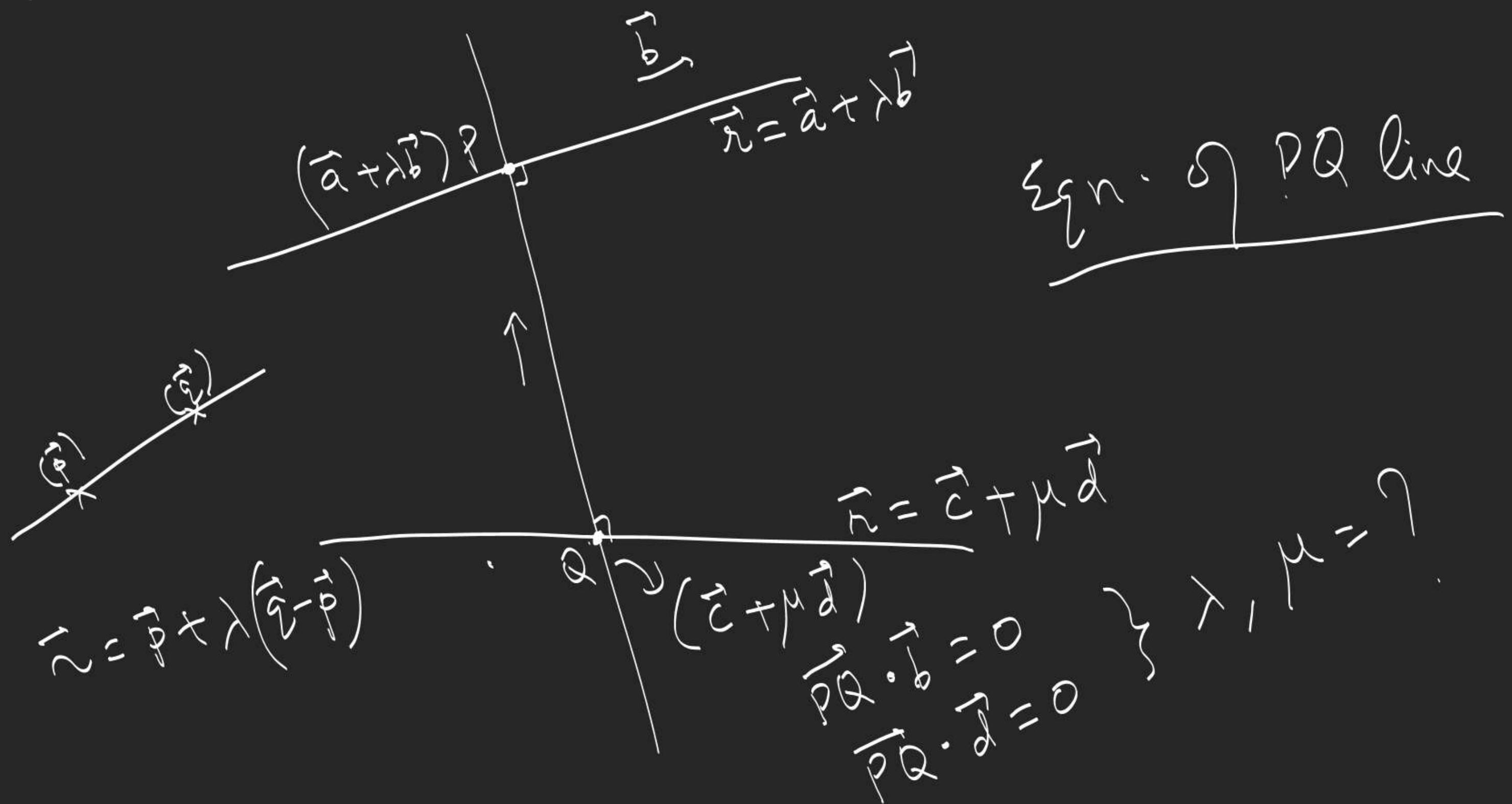


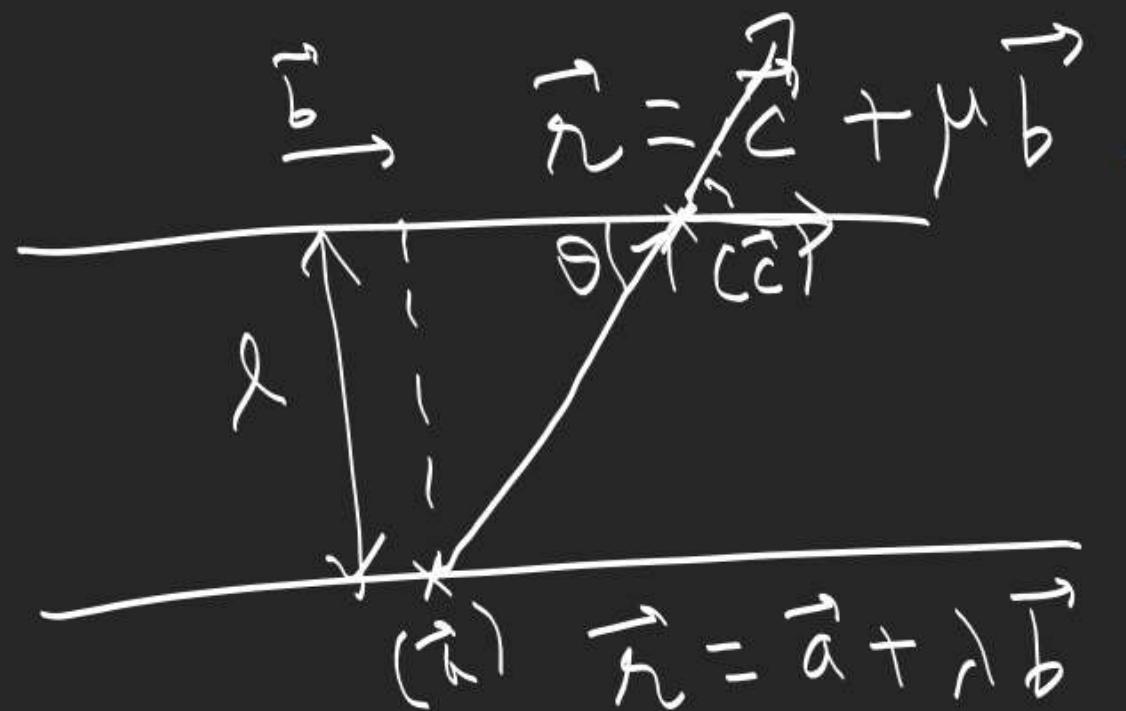
$$\begin{aligned}
 \text{Area} &= \frac{1}{2} \left(\frac{\vec{a} + \vec{b}}{2} \right) \rho \left(\frac{\vec{a}\vec{a} + \vec{b}\vec{b}}{\vec{a} + \vec{b}} \right) \\
 &= \frac{\sqrt{b^2 + a^2 + 2ab \cos C}}{2} \cdot \frac{2ab \cos C}{a+b} \\
 &= \frac{ab^2 + ba^2 + (b+a)ab \cos C}{2(a+b)} \\
 &= \frac{\sqrt{a^2 + b^2 + 2ab \cos C}}{2} \cdot \frac{2ab \cos C}{a+b}
 \end{aligned}$$



Shortest Distance b/w two Skew Lines





SD b/w two parallel Lines

$$d = |\vec{c} - \vec{a}| \sin \theta$$

$$= \left| \frac{(\vec{c} - \vec{a}) \times \vec{b}}{|\vec{b}|} \right|$$

L. Find the SD. b/w the lines

$$\vec{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k}$$

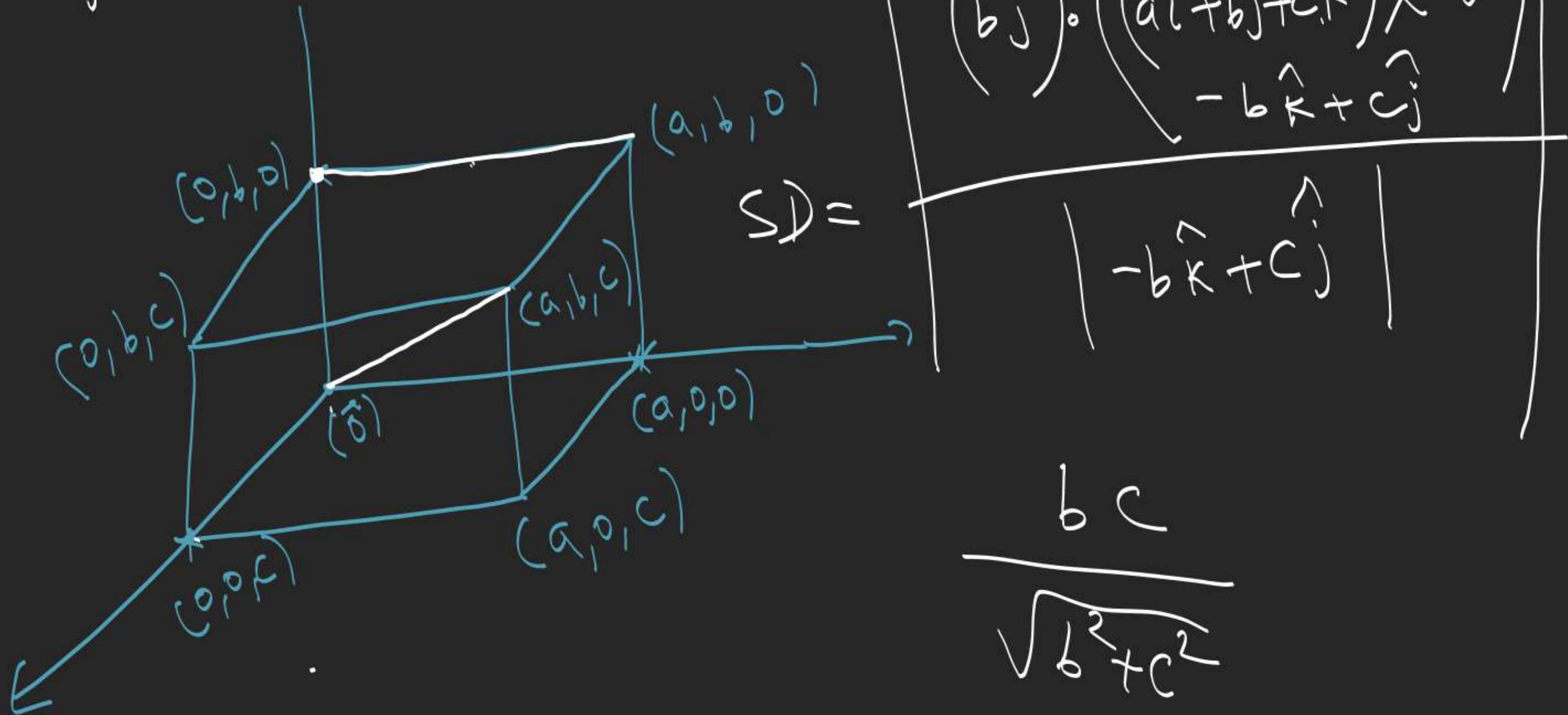
and $\vec{r} = (s+1)\hat{i} + (2s-1)\hat{j} - (2s+1)\hat{k}$

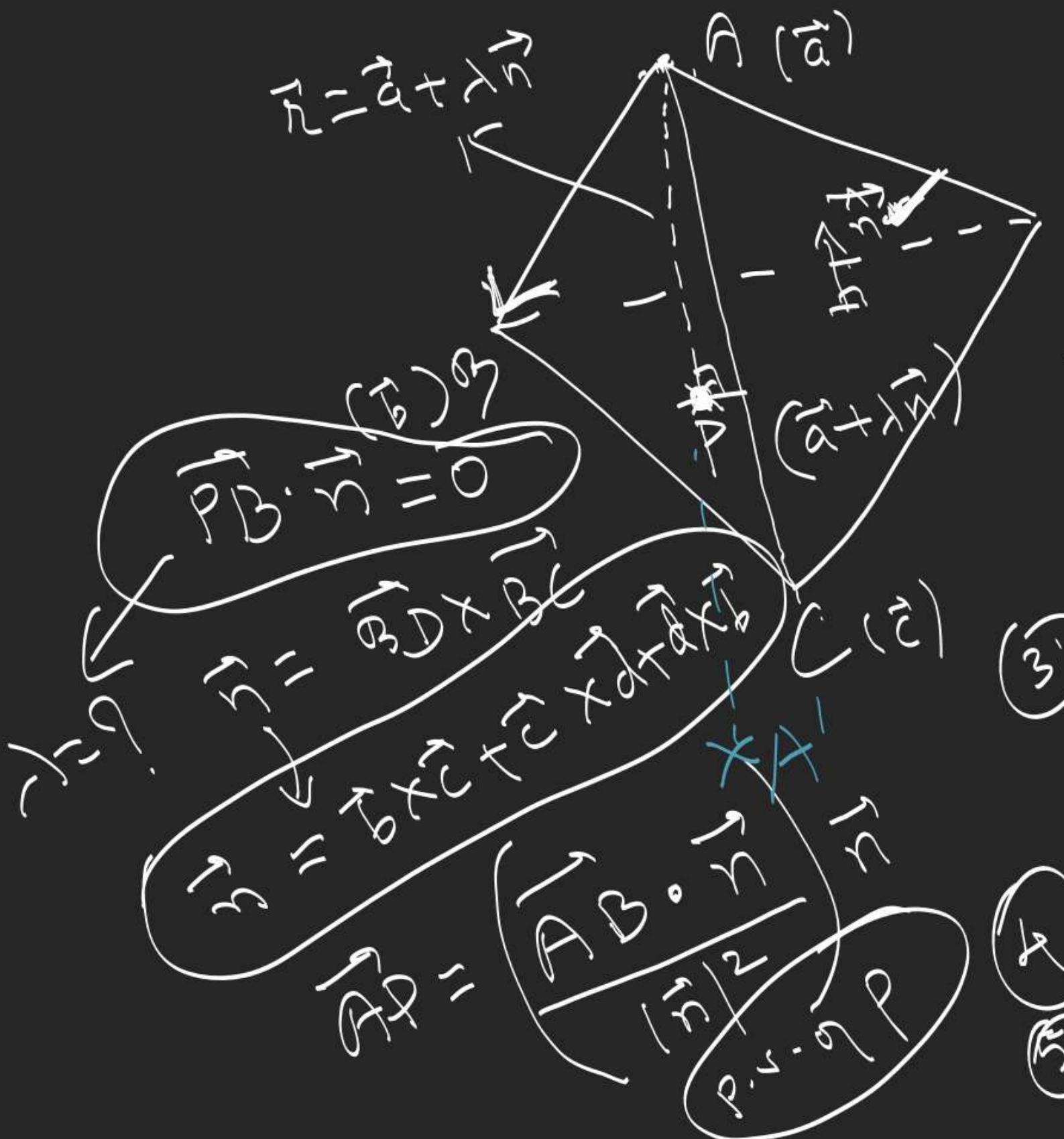
$$\frac{\left(\begin{pmatrix} \hat{i} \\ -2\hat{j} \\ 3\hat{k} \end{pmatrix} - \begin{pmatrix} \hat{i} \\ -\hat{j} \\ -\hat{k} \end{pmatrix} \right) \cdot \left(\begin{pmatrix} \hat{i} \\ -\hat{j} \\ 2\hat{k} \end{pmatrix} \times \begin{pmatrix} \hat{i} \\ +2\hat{j} \\ -2\hat{k} \end{pmatrix} \right)}{-2\hat{i} + 4\hat{j}}$$

$$\frac{8}{\sqrt{29}}$$

$$= \frac{(-\hat{j} + 4\hat{k}) \cdot (-2\hat{i} + 4\hat{j} + 3\hat{k})}{\sqrt{29}} \quad \left| \begin{array}{l} \hat{i} \\ \hat{j} \\ \hat{k} \end{array} \right| = \begin{pmatrix} 1 & 1 & 2 \\ 1 & -1 & 2 \\ 2 & 2 & -2 \end{pmatrix} = -2\hat{i} + 4\hat{j} + 3\hat{k}$$

2. Find the SD b/w the diagonal of a cuboid, the length of whose coterminous edges are a, b, c . and the edges not meeting it.





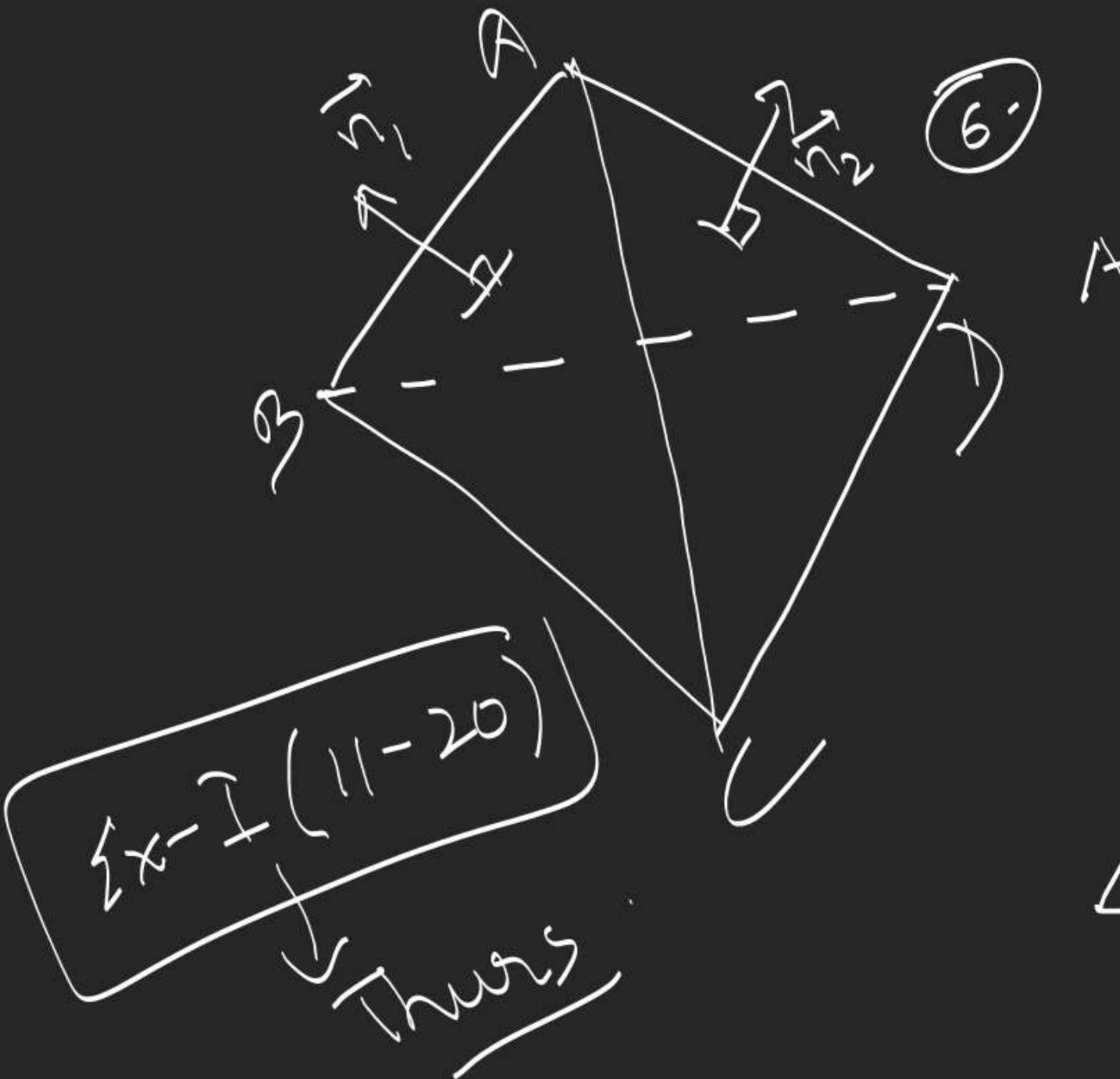
① Find p.v. foot of L on
from A on plane BCD.

$A' = 2P - A$

find p.v. of image of A
from plane BCD

$$\textcircled{3} \text{ Volume of tetrahedron } ABCD = \frac{1}{3} \times \frac{1}{2} |\vec{n}| \times |\vec{AP}|$$

find SD b/w AD & BC
find angle b/w lines AD & BC.



angle b/w planes

$A B C \& A C D'$

$$= \left| \frac{\vec{n}_1 \cdot \vec{n}_2}{|\vec{n}_1| |\vec{n}_2|} \right|$$

Diagram illustrating the formula for the angle between two planes:

$$\text{angle} = \left| \frac{\vec{n}_1 \cdot \vec{n}_2}{|\vec{n}_1| |\vec{n}_2|} \right|$$

The diagram shows a vertical line segment from the intersection point to the second plane, forming the hypotenuse of a right triangle. The angle between the vertical line and the second plane is labeled θ .