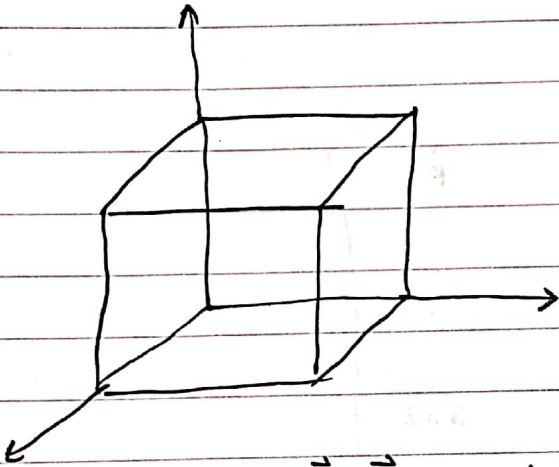


1. Hitunglah sudut antara diagonal



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

$$\vec{B} = -\hat{i} - \hat{j} + 2\hat{k}$$

$$\vec{A} \cdot \vec{B} = |\vec{A}| |\vec{B}| \cos \theta$$

$$2 \cdot \sqrt{6} \cdot \sqrt{6} \cos \theta$$

$$\cos \theta = \frac{2}{\sqrt{6} \cdot \sqrt{6}} = \frac{2}{6} = \frac{1}{3}$$

Soal

$$2. \vec{A} = 3x^2y \hat{i} + 2yz \hat{j} + xyz \hat{k}$$

$$\vec{B} = yz \hat{i} + 3xy^2 \hat{j} + 3xz \hat{k}$$

$\vec{A} \times \vec{B}$

	i	j	k
	$3x^2y$	$2yz$	xyz
	yz	$3xy^2$	$3xz$

$$= \hat{i} (6xy^2z^2 - 3x^2y^3z) - \hat{j} (9x^3yz - xy^2z^2) - \hat{k} (2y^2z^2 - 9x^3y^3)$$

$$u \cdot \nabla T =$$

$$T = x^2 + 2xy + 3z + 4$$

$$\nabla T = \hat{i} \frac{\partial}{\partial x} (x^2 + 2xy + 3z + 4)$$

$$\nabla T = (2x + 2y)\hat{i} + (2x)\hat{j} + (3)\hat{k}$$

$$a. \nabla^2 T = \hat{i} \frac{\partial}{\partial x} (2x) + \hat{j} \frac{\partial}{\partial y} (2x) + \hat{k} \frac{\partial}{\partial z} (3)$$

$$= 2$$

$$b. \nabla \times (\nabla T) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ 2x+2y & 2x & 3 \end{vmatrix}$$

$$= \hat{i} \left(\frac{\partial}{\partial y} \cdot 3 - \frac{\partial}{\partial z} \cdot 2x \right) - \hat{j} \left(\frac{\partial}{\partial x} \cdot 3 - \frac{\partial}{\partial z} \cdot 2x+2y \right)$$

$$- \hat{k} \left(\frac{\partial}{\partial y} \cdot 2x+2y - \frac{\partial}{\partial x} \cdot 2x \right)$$

$$= 0\hat{i} - 0\hat{j} - 0\hat{k}$$