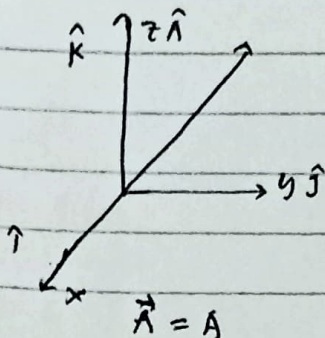


Kelistrikan & Kemagnetan

operator nabla & sistem Koordinat

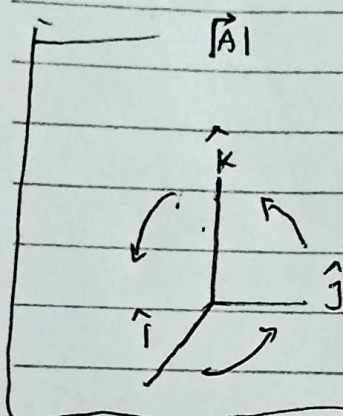
operator dalam tika

1) Analisis vektor



$$\vec{A} = x\hat{i} + y\hat{j} + z\hat{k}$$

$$\vec{A} = \frac{\vec{A}}{|\vec{A}|} = \frac{x\hat{i} + y\hat{j} + z\hat{k}}{\sqrt{x^2 + y^2 + z^2}}$$



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

$$\vec{B} = z\hat{i} + 2yx\hat{j} + 3xz\hat{k}$$

$$\begin{aligned} &\bullet \vec{A} + \vec{B} \\ &\bullet \vec{A} \cdot \vec{B} \\ &\bullet \vec{A} \times \vec{B} \end{aligned}$$

soal

$$\hat{i} \cdot \hat{i} = 1$$

$$\hat{k} \cdot \hat{k} = 1$$

$$\hat{z} \cdot \hat{z} = 1$$

$$\rightarrow (x^2y + z)\hat{i} + (3yz + 2yx)\hat{j} + (2xy + 3xz)\hat{k}$$

$$\rightarrow 1 - x^2yz + 6y^2xz + z^2x^2yz$$

$$\rightarrow 1(3yz)$$

$$\rightarrow (3yz)$$

$$\uparrow (x^2y - z) \cdot \hat{j} (3yz - 2yz) \cdot \hat{k} (2xy - 3xz)$$

$$A \times B \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ x^2y & 3yz & 2xy \\ z & 2yx & 3xz \end{vmatrix} =$$

$\hat{i}$	$\hat{j}$	$\hat{k}$	$\hat{i}$	$\hat{j}$
x^2y	$3yz$	$2xy$	x^2y	$3yz$
z	$2yx$	$3xz$	z	$2yx$

$$\uparrow (x^2y)(2yx) + \hat{j} (-$$

$$\uparrow (3yz)(3xz) + \hat{j} (2xy)(z) + \hat{k} (x^2y)(2yx)$$

$$\uparrow (9)$$

2

kiri kanan

No.

1 → 2-3 → 4 dirak dim proses fungsi

Date

4s sangat besar

$\hat{i}$	$\hat{j}$	$\hat{k}$
x^2y	$3yz$	$2xz$
z	$2yx$	$3xz$

$$\hat{i} (3yz - 3xz) - (\hat{j} (x^2y - 2yx) + \hat{k} (x^2y - 2xz))$$

$$\hat{i} (0 - 4xz) - (\hat{j} (x^2 - 2) + \hat{k} (x^2 - 2))$$

operator nabla

$$\nabla = \hat{i} \frac{\partial}{\partial x} + \hat{j} \frac{\partial}{\partial y} + \hat{k} \frac{\partial}{\partial z}$$

gradien

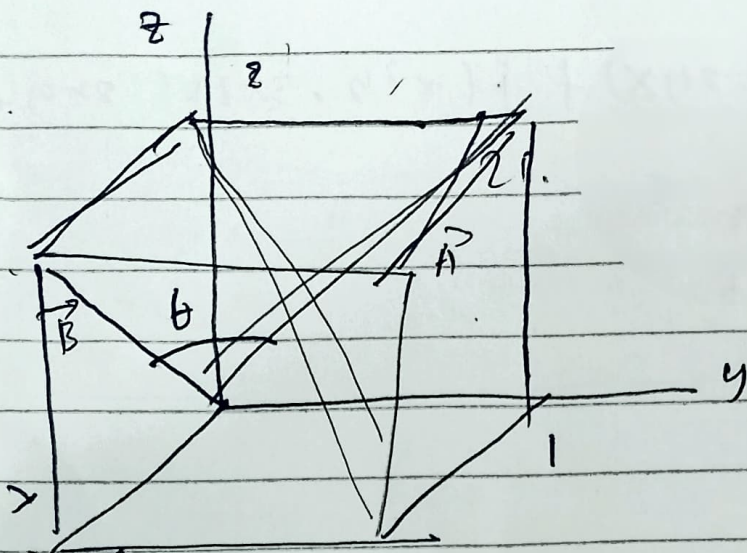
$$\vec{A} = 2x\hat{i} + 3y\hat{j} + 4z\hat{k}$$

$$\nabla \cdot \vec{A} =$$

$$\hat{i} \frac{\partial}{\partial x} (2x) +$$

$$\nabla \cdot \vec{A} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ 2x & 3y & 4z \end{vmatrix}$$

$$\hat{i} \left(\frac{\partial}{\partial x} \cdot 4z \right) - \left(\frac{\partial}{\partial y} \cdot 2x \right) \cdot \hat{j} \left(\frac{\partial}{\partial x} \cdot 3y \right) - \left(\frac{\partial}{\partial z} \cdot 2x \right) \cdot \hat{k} \left(\frac{\partial}{\partial y} \cdot 4z \right) - \left(\frac{\partial}{\partial z} \cdot 3y \right)$$



$$\vec{A} = 0\hat{i} + 1\hat{j} + 2\hat{k}$$

$$\vec{B} = 1\hat{i} + 0\hat{j} + 2\hat{k}$$

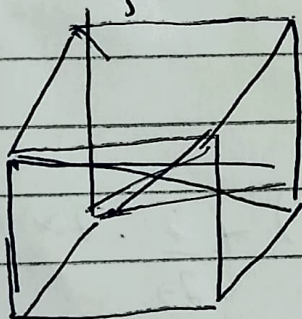
$$\vec{A} \cdot \vec{B} = |\vec{A}| |\vec{B}| \cos \theta$$

$$1 = \sqrt{5} \sqrt{5} \cos \theta$$

$$\cos \theta = \frac{1}{5}$$

$$\cos \theta = \frac{1}{5}$$

$$\theta = \cos^{-1} \frac{1}{5} \text{ Inv } \cos \frac{1}{5}$$



magical ruang

$$|\vec{A}| = 1\hat{i} + 1\hat{j} + 2\hat{k}$$

$$|\vec{B}| = 1\hat{i} - 1\hat{j} + 2\hat{k}$$

Am

$$2 = \sqrt{6} \sqrt{6} \cos \theta \rightarrow \cos \theta = \frac{2}{6}$$

$$\theta = \cos^{-1} \frac{1}{3} \text{ Inv } \cos \frac{1}{3}$$