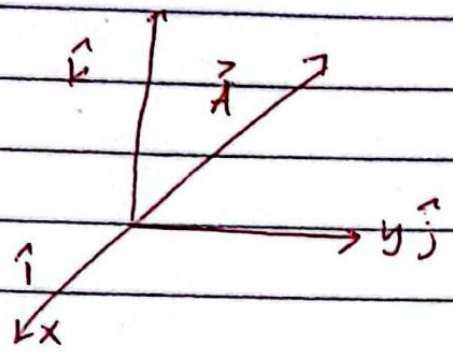
No. 22 Feb 2024

Date :

Operator dalam fisika

Analisis Vektor

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



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

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

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

1. $\vec{A} + \vec{B} = x\,y\hat{i} + 3yz\,j + 2xy\hat{i} + z\hat{j} + 2yx\,\hat{j} + 3xz\,\hat{k}$

$= x^2 y + z\hat{i} + 5y^2 + z + x\hat{j} + 5x^2 + y + 8z\hat{k}$

2. $\vec{A} \cdot \vec{B} = (x^2 y + z)\hat{i} \cdot (3yz + 2yx)\hat{j} \cdot (2xy + 3xz)\hat{k}$

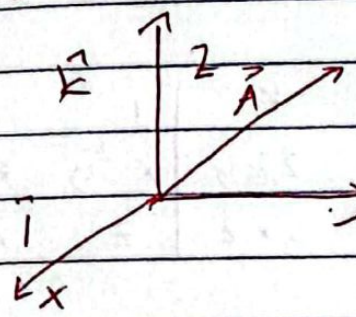
$= x^2 yz\,\hat{i} \cdot 5y^2 z\,x\hat{j} \cdot 5xyz\hat{k}$

No.

Date :

Operator dalam fisika

Analisis Vektor



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

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

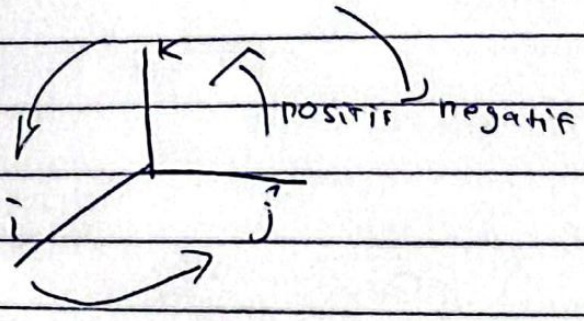
$$\vec{A} = x^2 y\,\hat{i} + yz\,\hat{j} + 2xy\,\hat{k}$$

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

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

$$= x^2 y + z\hat{i} + 5y^2 + z + x\hat{j} + 5x^2 + y + B$$

z ϕb



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

$$\vec{A} \times \vec{B} = \begin{array}{|ccc|cc} \vec{i} & \vec{j} & \vec{k} & i & j \\ x^2y & 3yz & 2xy & x^2y & 3yz \\ z & 2yx & 3xz & z & 2yx \end{array}$$

$$\vec{A} \times \vec{B} = (9xyz$$

No. 22 Feb 2024

Date :

Operator dalam fisika

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

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

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

$\vec{A} = 0\,i\,Ax + \hat{j}\,Ay + \hat{k}\,2k$

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

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

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

No. 22 Feb 2024

Date :

Operator Nabla (∇)

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

gradien

$$T = x^2yz + 3y^2z$$

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

=