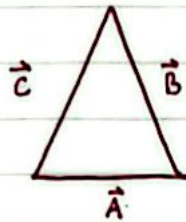


Soal 1



$$\vec{A} + \vec{B} = \vec{C}$$

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

$$\vec{B} = -\hat{i} - 2\hat{j} + 3\hat{k}$$

A. Hitung Vektor c

B. Hitung Sudut AB

(i)

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

$$:(\hat{i} + 2\hat{j} + 0\hat{k}) + (-\hat{i} - 2\hat{j} + 3\hat{k}) \cos \theta$$

$$:-1 - 4$$

$$:-5$$

(B)

(ii)

$$\vec{A} + \vec{B} = \vec{C}$$

$$(\hat{i} + 2\hat{j} + 0\hat{k}) + (-\hat{i} - 2\hat{j} + 3\hat{k}) = \vec{C}$$

$$0\hat{i} + 0\hat{j} + 3\hat{k} = \vec{C}$$

(A)

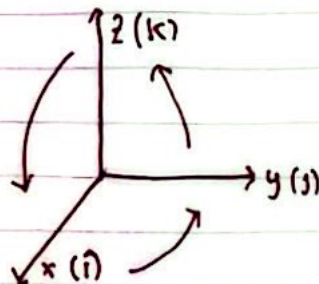
a) Perkalian Vektor Via dot

$$\vec{A} = 2\hat{i} + 3\hat{j} + \hat{k}$$

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

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

$$\vec{A} + \vec{B} \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 3 & 1 \\ 3 & 2 & 2 \end{vmatrix} = \hat{i}(6-2) - \hat{j}(4-3) - \hat{k}(9-4)$$



B) Perkalian Vektor Via cos

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

$$\vec{B} = xy\hat{i} + 2x\hat{j} + 3x\hat{k}$$

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

$$\vec{A} \times \vec{B} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2x & 3x^2 & 4xy \\ xy & 2x & 3x \end{vmatrix}$$

$$= \hat{i}(9x^2 - 8x^2y) - \hat{j}(6x^2 - 4x^2y) - \hat{k}(3x^3y - 4x^2)$$

Operator Nabla (∇)

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

$$T = x + 2y + 3z^2 \quad \leftarrow \text{Skalar}$$

$$\rightarrow \nabla T = \hat{i} + \hat{j}(2) + \hat{k}(6z)$$

$$\text{Gradien} = \hat{i} + 2\hat{j} + 6z\hat{k}$$

Hitung diverensi vektor tersebut

$$a) V_1 = x^2\hat{i} + 3xz\hat{j} - 2xz\hat{k}$$

$$b) V_2 = xy\hat{i} + 2z\hat{j} + 3xz\hat{k}$$

$$c) V_3 = y^2\hat{i} + (2xy + z^2)\hat{j} - 2y\hat{k}$$

Jawab

$$a) \nabla \cdot V_1 = 2x + 0\hat{j} - 2x = 0$$

$$b) \nabla \cdot V_2 = y + 2 + 3x = 3x + y + 2$$

$$c) \nabla \cdot V_3 = 0\hat{i} + 2x\hat{j} - 2y\hat{k}$$