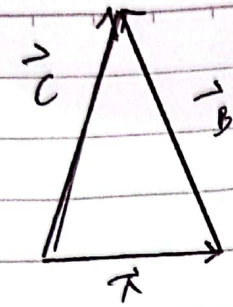
No.

Date

Soal:

① 

Gra

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

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

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

a. Hitung vektor C

b. Hitung sudut $\vec{AB}$

(a) $\vec{A} \cdot \vec{B} = (\hat{i} + 2\hat{j} + 0\hat{k}) + (-\hat{i} + 2\hat{j} + 3\hat{k})$

$= -\hat{i} + 4\hat{j} + 0\hat{k} = -5$ / B → C

(b) $|\vec{A}| = \sqrt{1 + 4 + 0}$

$|\vec{B}| = \sqrt{-1 - 4 + 9}$

$B \cdot 5 = \sqrt{5} \cdot \sqrt{14}$

$\theta = \arccos \frac{B \cdot 5}{\sqrt{5} \cdot \sqrt{14}}$

No.

Date

• soal 2 :

a. Perkalian vektor via dot

b. Perkalian vektor via cros

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

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

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

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

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

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

$= 2x^2y + 6x^3 + 12x^2y$

$= .$

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

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

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

No.

Date

Soal. 3.

Operator Nabla (∇)

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

$T = x + 2y + 3z^2$ ← Skala

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

Gradien : $\hat{i} + 2\hat{j} + 6zk$

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

Divergensi

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

Hitung divergensi vektor berikut

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

b. $V_2 = xy\hat{i} + 2yz\hat{j} + 2xz\hat{k}$

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

Jawab a. $\nabla \cdot V_1 = \hat{i}\frac{\partial V_1}{\partial x}(x^2\hat{i} + 3xz^2\hat{j} - 2xz\hat{k})$

b. $\nabla \cdot V_2 = \hat{i}\frac{\partial V_2}{\partial x}(xy\hat{i} + 2yz\hat{j} + 2xz\hat{k})$

c. $\nabla \cdot V_3 = \hat{i}\frac{\partial V_3}{\partial x}(y^2\hat{i} + 2xy\hat{j} + z)\hat{j} - 2y\hat{k})$

No.

Date . .

a. $\nabla \cdot \vec{v}_1 = 2x\hat{i} + 0\hat{j} - 2x$

b. $\nabla \cdot \vec{v}_2 = x\hat{i} + 2z\hat{j} + 3xz\hat{k}$

c. $\nabla \cdot \vec{v}_3 = 2y\hat{i} + 4xyz\hat{j} - 2y\hat{k}$