

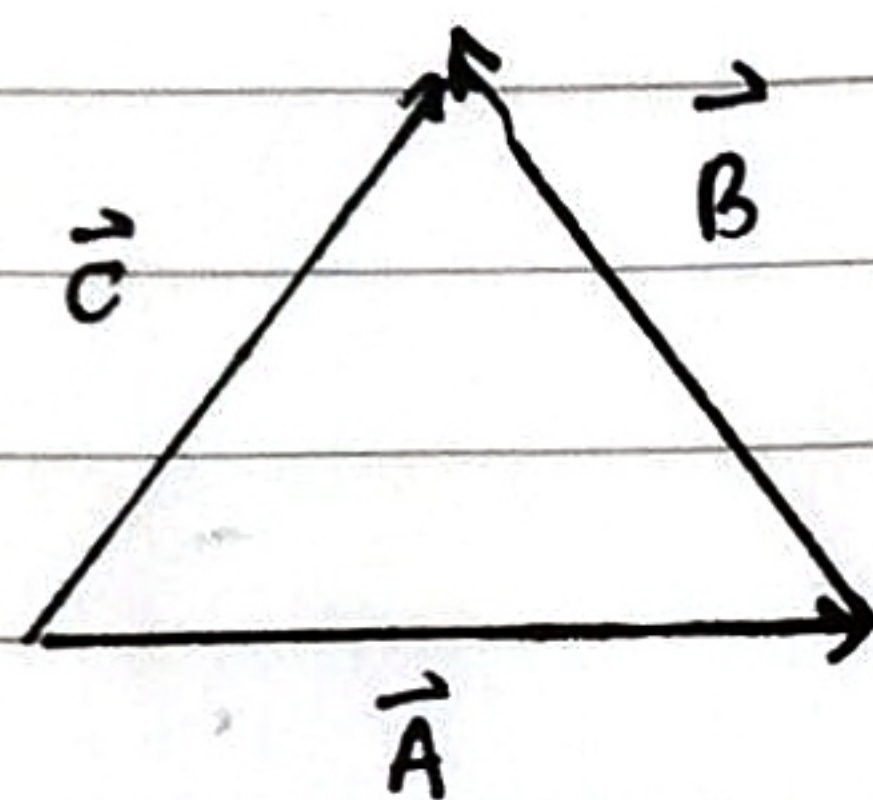
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No.

Date

Kelistrikan dan Kemagnetan

Soal no 1 ↓



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

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

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

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

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

- sudut $\vec{A} \vec{B}$

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

$$= -1 - 4 + 0 = -5$$

$$|\vec{A}| = \sqrt{1^2 + 2^2 + 0^2}$$

$$= \sqrt{5}$$

$$|\vec{B}| = \sqrt{(-1)^2 + (-2)^2 + (3)^2}$$

$$= \sqrt{1 + 4 + 9}$$

$$= \sqrt{14}$$

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

$$-5 = \sqrt{5} \sqrt{14} \cos \theta$$

$$\theta = \arccos \frac{-5}{\sqrt{5} \sqrt{14}}$$

Soal no 2 ↓

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

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

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

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

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

Soal no 3 ↓

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

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

c) $\nabla \cdot V_3 = 0\hat{i} + (2x + z^2) + -2y$