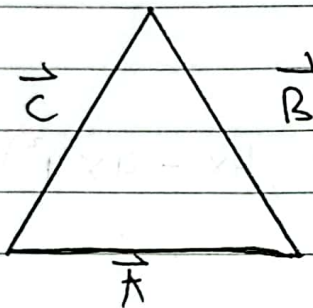


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Soal 1



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

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

Hitung Vektor C
Hitung sudut $\vec{A}\vec{B}$

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

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

$$\begin{aligned}\vec{A} \cdot \vec{B} &= |\vec{A}| \cdot |\vec{B}| \cos \theta \\ &= (\hat{i} + 2\hat{j} + 0\hat{k}) \cdot (-\hat{i} - 2\hat{j} + 3\hat{k}) \\ &= (-1 - 4 + 0) \\ &= -5\end{aligned}$$

$$|\vec{A}| = \sqrt{1^2 + 2^2 + 0^2} = \sqrt{1 + 4 + 0} = \sqrt{5}$$

$$|\vec{B}| = \sqrt{(-1)^2 + (-2)^2 + 3^2} = \sqrt{1 + 4 + 9} = \sqrt{14}$$

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

Soal 2.

Perkalian Vektor Via Cross

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

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

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

Soal 3.

Hitung divergensi Vektor

$$a) \vec{V}_1 = x^2\hat{i} + 3xz^2\hat{j} - 2xz\hat{k}$$

$$\vec{V}_2 = xy\hat{i} + 2yz\hat{j} + 3xz\hat{k}$$

$$\vec{V}_3 = y^2\hat{i} + (2xy + z^2)\hat{j} - 2yz\hat{k}$$

Jawab :

$$a) \vec{V}_1 = 2x\hat{i} + 6xz\hat{j} - 2x\hat{k}$$

$$\vec{V}_2 = \cancel{\hat{i} + 2z\hat{j}} + 3x\hat{k}$$

Jawab

Jawaban Slide berikutnya

$$\vec{V}_3 = 2\hat{i} + 2x + 2z\hat{j} - 2y\hat{k}$$

$$a) \nabla \cdot \vec{V} = \frac{2}{2x}$$

Jawaban no 3

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

$$= 2x \hat{i} + 0 \hat{j} - 2x \hat{k}$$

$$b). V_2 : \nabla V = \hat{i} \frac{\partial}{\partial x} (xy \hat{i} + 2yz \hat{j} + 3xz \hat{k})$$

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

$$= (2x + z^2) - 2y$$

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

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