

Hitung sudut antara diagonal ruang

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

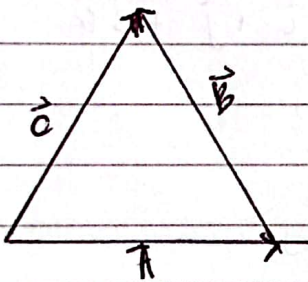
$$\vec{B} = \hat{i} + \hat{j} + \hat{k}$$

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

$$= (\hat{i} + \hat{j} + \hat{k})(\hat{i} + \hat{j} + \hat{k})$$

=

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 AB

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

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

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

$$= \hat{i} - 4\hat{j} + 0\hat{k} = -5$$

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

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

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

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

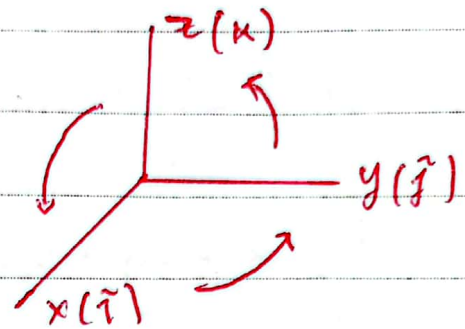
$$\theta = \arccos \frac{-5}{\sqrt{5} \sqrt{14}}$$

a.) Perkalian Vektor via dot

b.) Perkalian Vektor via cos

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

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



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

Soal 2

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

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

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

Soal 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 :

$$a.) \nabla \cdot V_1 = 2x + 0 - 2x$$

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

$$c.) \nabla \cdot V_3 = 2y + (2x + z^2) - 2y$$