

No. _____

Date: _____

Kalimat dan Kemagnetan

Rule of mathematic in physic

Kektor memiliki besaran dan arah

$$\vec{r} = x_1 \hat{i} + x_2 \hat{j} + x_3 \hat{k}$$

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

$$\vec{u}_2 = y_1 \hat{i} + y_2 \hat{j} + y_3 \hat{k}$$

$$\hat{r} = \frac{\vec{r}}{|\vec{r}|}$$

example

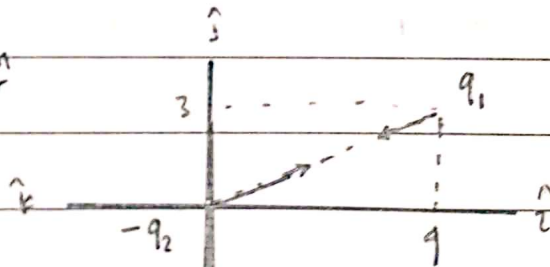
$$\hat{i} \cdot \hat{i} = 1$$

$$\hat{j} \cdot \hat{j} = 1$$

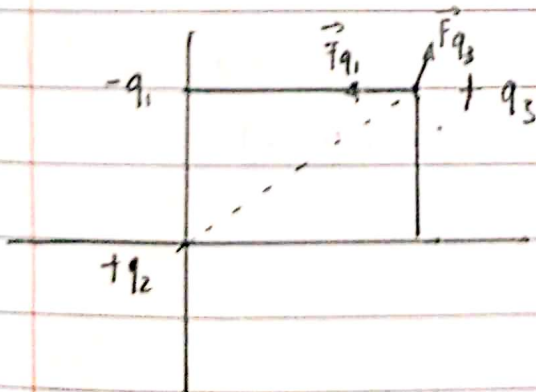
$$\hat{k} \cdot \hat{k} = 1$$

$$\hat{r} = \frac{x \hat{i} + y \hat{j} + z \hat{k}}{\sqrt{x^2 + y^2 + z^2}}$$

$$\vec{F}_{12} = k \frac{q_1 \cdot q_2}{r^2} \hat{r}$$



$$\vec{F}_{12} = k \frac{q_1 \cdot q_2}{\sqrt{3^2 + 4^2}} \left(\frac{-4 \hat{i} - 3 \hat{j}}{5} \right)$$



$$\vec{F}_{q3} = k \left[q_3 \left(\frac{4 \hat{i} - 1 \hat{j}}{5} \right) + q_2 \left(\frac{4 \hat{i} + 3 \hat{j}}{5} \right) \right]$$

$$\vec{u}_1 = 4\hat{i} + 2\hat{j} + \hat{k}$$

$$\vec{u}_2 = 2\hat{i} + 3\hat{k}$$

$$\vec{u}_1 \cdot \vec{u}_2 = 4 \cdot 2 \hat{i} \cdot \hat{i} + 2 \cdot 0 \hat{j} \cdot \hat{j} + 1 \cdot 3 \hat{k} \cdot \hat{k}$$

$$\vec{u}_1 \cdot \vec{u}_2 = 8 + 0 + 3 = 11$$

$$\vec{a} = 3\hat{i} + 4\hat{j} - 3\hat{k}$$

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

$$\vec{a} \cdot \vec{a} = 3 \cdot 3 \hat{i} \cdot \hat{i} + 4 \cdot 4 \hat{j} \cdot \hat{j} - 3 \cdot (-3) \hat{k} \cdot \hat{k} = 9 + 16 + 9 = 34$$

$$\vec{a} \times \vec{b} = 3 \cdot 2 \hat{i} \cdot \hat{i} + 4 \cdot (-3) \hat{j} \cdot \hat{j} + (-3) \cdot 2 \hat{k} \cdot \hat{k} = 6 + (-12) + (-6) = -12$$

$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 3 & 4 & -3 \\ 2 & -3 & 2 \end{vmatrix}$$

$$= \hat{i}(4 \cdot 2) - (-3 \cdot (-3)) - \hat{j}(3 \cdot 2) - (-3 \cdot 2) - \hat{k}(3 \cdot (-3) - 4 \cdot 2)$$

$$= \hat{i}(8 - 9) - \hat{j}(6 + 6) + \hat{k}(-9 - 8)$$

$$= -\hat{i} - 12\hat{j} - 17\hat{k}$$