

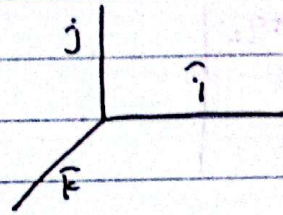
RPS & kontrak kuliah

► Role of mathematic in physic

1. vector

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

$$\vec{v} = v_1 \hat{i} + v_2 \hat{j} + v_3 \hat{k}$$



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

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

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

$$\hat{i} \cdot \hat{j} = 0$$

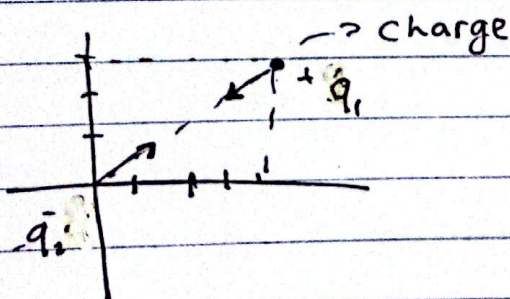
$$\hat{i} \times \hat{j} = \hat{k}$$

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

$$\hat{j} \cdot \hat{k} = 0$$

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

$$\hat{k} \cdot \hat{i} = 0$$

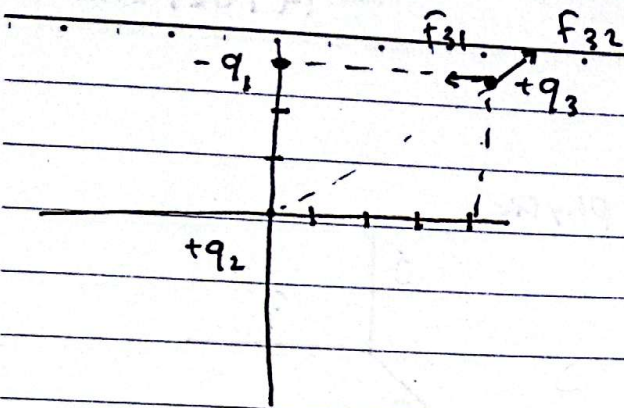


$$F_{q_2} = k \frac{q_1 q_2}{r^2} \hat{r}$$

$$= k \frac{q_1 q_2}{5^2} \frac{4\hat{i} + 3\hat{j}}{5^2}$$

$$F_{q_1} = k \frac{q_1 q_2}{r^2} \hat{p}$$

$$= k \frac{q_1 q_2}{\sqrt{3^2 + 4^2}} \frac{(-4\hat{i} - 3\hat{j})}{5^2}$$



lurus = 1

ga lurus pythagoras

$$f_{31} = \vec{r} =$$

$$F_{q_{31}} =$$

$$F = F_{q_{31}} + F_{q_{32}}$$

$$= k \left[\frac{q_1 (-\hat{i})}{4^2} + \frac{q_2}{5^2} \frac{(4\hat{i} + 3\hat{j})}{5} \right]$$

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

$$F = \frac{q_1 q_2}{r^2} \hat{r}$$

$$\hat{r} = \frac{\vec{r}}{|\vec{r}|} = \frac{-4\hat{i} + 0\hat{j} + 0\hat{k}}{\sqrt{4^2}} = -\frac{4\hat{i}}{4} = -\hat{i}$$

$$\vec{v}_1 = 4\hat{i} + 2\hat{j} + \hat{k} \quad \vec{v}_1 \cdot \vec{v}_2$$

$$\vec{v}_2 = 2\hat{j} + 3\hat{k}$$

$$\vec{v}_1 \cdot \vec{v}_2 = 4 + 3 = 7$$

$$8 + 3 = 11$$

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

$$= 8 + 0 + 3$$

$$= 11$$

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

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

$$a.) \quad \vec{a} \cdot \vec{a} = 9 + 16 + 9 = 34$$

$$b.) \quad \vec{a} \times \vec{b} =$$

$$c.) \quad \vec{a} \cdot \vec{b} = 6 - 12 - 6 = -12$$

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

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

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