

KALISMA

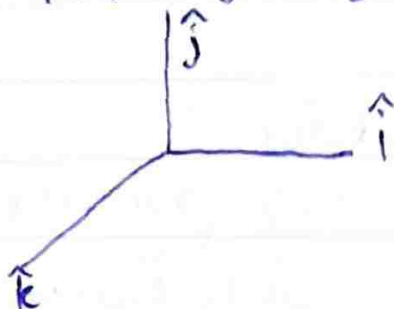
14-02-2025

Rule Of Mathematics

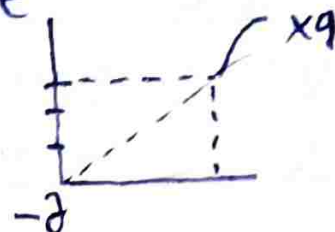
$$\vec{r} = x_1 \hat{i} + x_2 \hat{j} + x_3 \hat{k}$$

$$\vec{r} = q_1 \hat{i} + q_2 \hat{j} + q_3 \hat{k}$$

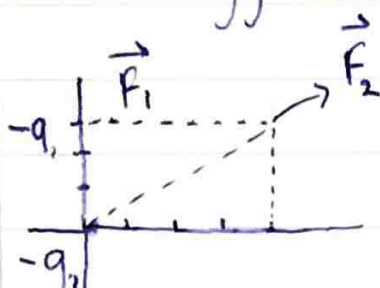
$$\hat{p} = \frac{\vec{r}}{|\vec{r}|} = \frac{x_1 \hat{i} + y_1 \hat{j} + z_1 \hat{k}}{\sqrt{x^2 + y^2 + z^2}}$$



explore



$$\vec{r} = x_1 \hat{i} + y_1 \hat{j} + z_1 \hat{k}$$



$$\vec{F} = k \frac{\partial_1 \partial_2}{r^2} \hat{p}$$

$$k \frac{\partial_1 \partial_2}{\sqrt{3^2 + 4^2}} \frac{(-4\hat{i} - 3\hat{j})}{5^2}$$

$$|\vec{r}| = \sqrt{4^2 + 3^2} = 5$$

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

$$\vec{F}_{23} = \vec{F}_{31} + \vec{F}_{32}$$

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

$$= k q_3 \left[\frac{q_1 (-1)}{4} + \frac{q_2}{5^2} \right] (4\hat{i} + 3\hat{j})$$

$$p^2 \leftarrow 5^2$$

$$u_1 = 4\hat{i} + 2\hat{j} + \hat{k}$$

$$u_2 = 2\hat{i} + 3\hat{j}$$

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

$$= 8 \cdot 1 + 3 \cdot 1$$

$$= 8 \times 3 = 11$$

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

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

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

$$\vec{a} \cdot \vec{b} = 6 - 12 - 6 = 6 - 18 = -12$$

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

$$= \hat{i}(8 - 9) - \hat{j}(6 + 6) + \hat{k}(-9 - 8) \\ = -\hat{i} - 12\hat{j} - 17\hat{k}$$