No. 14 Februari 2025

Date

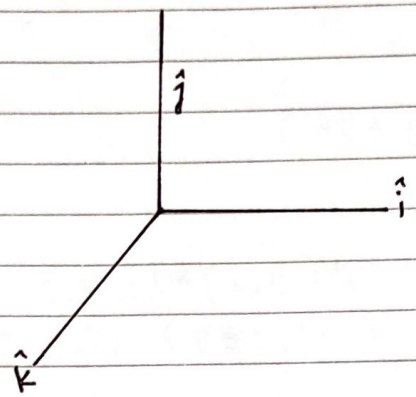
KALISMA

Role of mathematic in physic

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

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

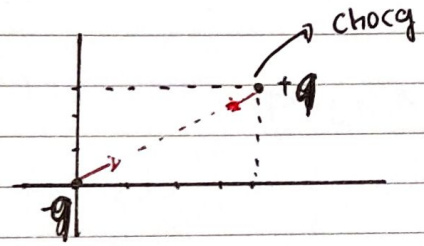
$\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$



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

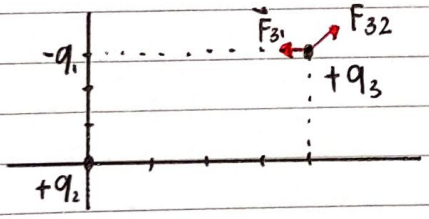
$= \frac{x\hat{i} + y\hat{j} + z\hat{k}}{\sqrt{x^2+y^2+z^2}}$

$\left.\begin{matrix} i\cdot\hat{i} \\ \hat{j}\cdot\hat{j} \\ \hat{i}\cdot\hat{i} \\ i\cdot\hat{j} \end{matrix}\right| = 1$



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

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



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

$\hat{r} = \frac{\vec{r}}{|r|} = \frac{4\hat{i}+3\hat{j}}{\sqrt{4^2+3^2}} = \frac{4\hat{i}+3\hat{j}}{5}$

$F_{q3} = \vec{F}_{31} + \vec{F}_{32}$

$= kq_3\left[\frac{q_1(-\hat{i})}{4^2} + \frac{q_2}{5^2}\frac{(4\hat{i}+3\hat{j})}{5}\right]$

r^2

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

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

$\vec{v}_1 \cdot v_2 = 8\hat{i} + 2\hat{j} + 8.1 + 3.1 = 11$

kanan - kiri = Negatif
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$\vec{a} = 3\vec{i} + 4\vec{j} - 3\vec{k}$
$\vec{b} = 2\vec{i} - 3\vec{j} + 2\vec{k}$

$\vec{a} \cdot \vec{b} = 3($

Cari : 1). $\vec{a} \cdot \vec{a} = 3(3)i + 4(4)j + 3(-3)k$ atau $(3i+4j-3k)(3i+4j-3k)$

$= 9i + 16j + 9k$ $= 9 + 16 + 9$

$= 34$ $= 34$

3). $\vec{a} \cdot \vec{b} = (3\vec{i} + 4\vec{j} - 3\vec{k})(2\vec{i} - 3\vec{j} + 2k)$

$= 6 - 12 - 6 = -12$

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

$\vec{i}$	$\vec{j}$	$\vec{k}$	$\vec{i}$	$\vec{j}$
3	4	-3	3	4
2	-3	2	2	-3

$= (4.2.i) + (j.-3.2) + (k.3.-3)$

$(j.3.2) + (i.-3.-3) + (k.-4.2)$

$= 8i - 6j - 9k + 6j + 9i + 8k$

$= 17i - k$

$i(8-9) + j(6+6) + k(-9-8) = -i + 12j - 17k$