

NAMA : ADINDA PUTRI PURNAMASARI

NPM: 2213022092

The image shows a piece of paper with handwritten mathematical and physics notes. At the top, the name 'ADINDA PUTRI PURNAMASARI' and NPM '2213022092' are written. The notes are organized into several sections:

- Unit Vector $\hat{r}$:** Two boxes define the unit vector $\hat{r}$. The first box shows $\hat{r} = \frac{\vec{r}}{|\vec{r}|} = \frac{x\hat{i} + y\hat{j} + z\hat{k}}{\sqrt{x^2 + y^2 + z^2}}$. The second box shows $\hat{r} = \frac{\vec{r}}{|\vec{r}|} = \frac{x\hat{i} + y\hat{j} + z\hat{k}}{\sqrt{x^2 + y^2 + z^2}}$. Above the second box is a small diagram of a vector $\vec{r}$ in a 3D coordinate system.
- Coulomb's Law:** A box shows the formula $\vec{F} = k \frac{q_1 q_2}{r^2} \hat{r}$.
- Role of Mathematics in Physics:** A section titled 'Role of mathematics in physics' contains the vector equation $\vec{r} = x_1 \hat{i} + x_2 \hat{j} + x_3 \hat{k}$.
- Force Calculation:** Below the vector equation, the force F_{32} is calculated as $F_{32} = \hat{F}_{31} + \hat{F}_{32}$. This is followed by a complex expression: $= k q_3 \left[\frac{q_1 (-i)}{q^2} + \frac{q_2}{5^2} \frac{(9i + 3j)}{5^2} \right]$. A small diagram shows a vector $\vec{r}$ in a 3D coordinate system.

No.

Date

Positif = kiri - kiri - kanan
Negatif = kiri - kanan - kiri

$$\vec{a} = 4\vec{i} - 5\vec{j} + \vec{k}$$

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

$$a \times b = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 4 & -5 & 1 \\ 2 & 3 & -2 \end{vmatrix} = \cancel{4(-10-3)} \vec{i} (10-3) + \vec{j} (-8-2) + \vec{k} (-10-12)$$
$$= 7\vec{i} - 10\vec{j} - 22\vec{k}$$