

Unit vector

A *unit vector* is a vector whose magnitude is 1.

The unit vector in the same direction as vector \mathbf{r} is $\frac{\mathbf{r}}{|\mathbf{r}|}$. It is sometimes written as $\hat{\mathbf{r}}$.

By convention, we often define three unit vectors, \mathbf{i} , \mathbf{j} and \mathbf{k} to be parallel to the x , y and z coordinate axes.

So in column notation, $\mathbf{i} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$, $\mathbf{j} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ and $\mathbf{k} = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$.