

ANSWER on Question #68804 – Math – Analytic Geometry

QUESTION

Find the magnitude of vector

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

SOLUTION

By the definition, for any vector

$$\vec{r} = r_x\vec{i} + r_y\vec{j} + r_z\vec{k} \rightarrow \underbrace{|\vec{r}|}_{\text{magnitude}} = \sqrt{r_x^2 + r_y^2 + r_z^2}$$

In our case,

$$\vec{a} = 3\vec{i} - 2\vec{j} + 2\vec{k} \leftrightarrow \begin{cases} a_x = 3 \\ a_y = -2 \\ a_z = 2 \end{cases}$$

Then, the magnitude of vector is given by

$$|\vec{a}| = \sqrt{a_x^2 + a_y^2 + a_z^2} = \sqrt{(3)^2 + (-2)^2 + (2)^2} = \sqrt{9 + 4 + 4} = \sqrt{17}$$

ANSWER:

$$\boxed{|\vec{a}| = |3\vec{i} - 2\vec{j} + 2\vec{k}| = \sqrt{17}}$$