

1.9.15

EE24BTECH11012 - Bhavanisankar G S

QUESTION

If \mathbf{a} , \mathbf{b} , \mathbf{c} are position vectors of the points $\mathbf{A} \begin{pmatrix} 2 \\ 3 \\ -4 \end{pmatrix}$, $\mathbf{B} \begin{pmatrix} 3 \\ -4 \\ -5 \end{pmatrix}$, and $\mathbf{C} \begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$ respectively,

then $|\mathbf{a} + \mathbf{b} + \mathbf{c}|$ is equal to

SOLUTION

Variable name	Description	Formula
A	$\begin{pmatrix} 2 \\ 3 \\ -4 \end{pmatrix}$	
B	$\begin{pmatrix} 3 \\ -4 \\ -5 \end{pmatrix}$	
C	$\begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$	
D	Distance of the point from the origin.	$\left \mathbf{D} \begin{pmatrix} a \\ b \\ c \end{pmatrix} \right = \sqrt{a^2 + b^2 + c^2} = ? \text{ (D ist$

TABLE 0: Variables Used

Let

$$\mathbf{A} + \mathbf{B} + \mathbf{C} = \begin{pmatrix} 8 \\ 1 \\ -12 \end{pmatrix} \quad (0.1)$$

$$\left| \begin{pmatrix} a \\ b \\ c \end{pmatrix} \right| = \sqrt{a^2 + b^2 + c^2} \quad (0.2)$$

$$\Rightarrow |\mathbf{a} + \mathbf{b} + \mathbf{c}| = \sqrt{209} \quad (0.3)$$

$$(0.4)$$

Hence, the answer to the given question is $\sqrt{209}$.

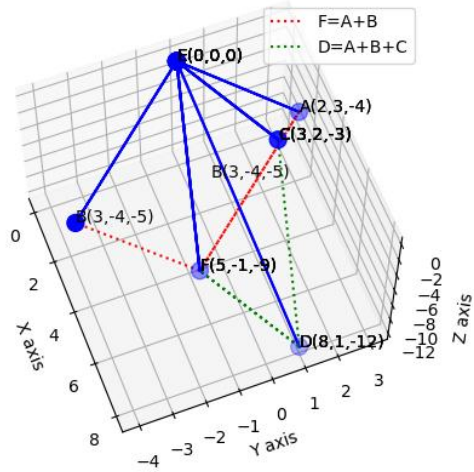


Fig. 0.1: A plot of the points given with the origin