1.2.14

EE24BTECH22053 - S A Aravind Eswar

Question: Verify if the points **A**(4, 3), **B**(6, 4), **C**(5, -6) and **D**(-3, 5) are the vertices of a parallelogram.

Solution:

Symbol	Value	Description
A	$\begin{pmatrix}4\\3\end{pmatrix}$	Point **A**
B	$\begin{pmatrix}6\\4\end{pmatrix}$	**B**
C	$\begin{pmatrix}5\\-6\end{pmatrix}$	**C**
D	$\begin{pmatrix}-3\\5\end{pmatrix}$	**D**

TABLE 0
GIVEN VALUES

For points **A**,**B**,**C** and **D** to form a parallelogram, we'll need 2 vectors formed by different points to be equivalent.

$$\mathbf{AB} = \mathbf{B} - \mathbf{A} = \begin{pmatrix}2\\1\end{pmatrix}$$

$$\mathbf{BC} = \mathbf{C} - \mathbf{B} = \begin{pmatrix}-1\\-10\end{pmatrix}$$

$$\mathbf{CD} = \mathbf{D} - \mathbf{C} = \begin{pmatrix}-8\\11\end{pmatrix}$$

$$\mathbf{DA} = \mathbf{A} - \mathbf{D} = \begin{pmatrix}7\\-2\end{pmatrix}$$

$$\mathbf{BD} = \mathbf{D} - \mathbf{B} = \begin{pmatrix}-9\\1\end{pmatrix}$$

$$\mathbf{AC} = \mathbf{C} - \mathbf{A} = \begin{pmatrix}1\\-9\end{pmatrix}$$

But here, we see no such possibility arising with the vectors. And thus, the points **A**,**B**,**C** and **D** are not forming a parallelogram.

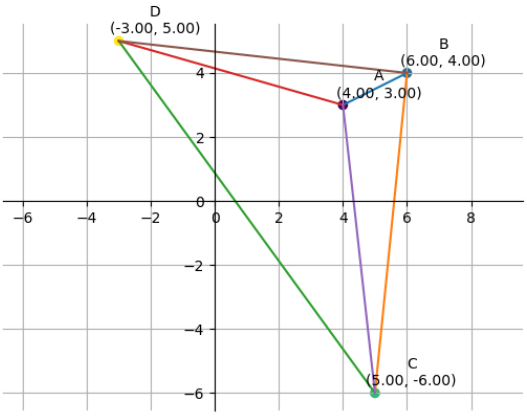

Fig. 0. Points **A**,**B**,**C** and **D**