1-1.2-11

EE24BTECH11027-satwikagv

Question:
If the points $\mathbf{A}\,(6,1)\,,\mathbf{B}\,(8,2)\,,\mathbf{C}\,(9,4)\,,\mathbf{D}\,(p,3)$ are the vertices of a parellelogram, taken in order, find the value of p.

Solution:
Given the points are the vertices of a parllelogram.
If $ABCD$ is a parellelogram with $AB \| CD$,

B-A=C-D

$$\begin{pmatrix}8\\2\end{pmatrix}-\begin{pmatrix}6\\1\end{pmatrix}=\begin{pmatrix}9\\4\end{pmatrix}-\begin{pmatrix}p\\3\end{pmatrix}$$

$$\begin{pmatrix}2\\1\end{pmatrix}=\begin{pmatrix}9-p\\1\end{pmatrix}$$

9-p=2
p=7