Coordinate Geometry

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Class 10^{th} Maths - Chapter 7

This is Problem-10 from Exercise 7.2

1. Find the area of the rhonmbus whose vertices are: (3,0),(4,5),(-1,4),(-2,-1)

$$(3,0),(4,5),(-1,4),(-2,-1) \tag{1}$$

Solution:
Given Data:

$$A = \begin{pmatrix} 3 \\ 0 \end{pmatrix} \tag{2}$$

$$B = \begin{pmatrix} -4 \\ 5 \end{pmatrix} \tag{3}$$

$$C = \begin{pmatrix} -1 \\ -4 \end{pmatrix} \tag{4}$$

$$D = \begin{pmatrix} -2 \\ -1 \end{pmatrix} \tag{5}$$

$$\tag{6}$$

$$\mathbf{AC} = \begin{pmatrix} 4 \\ 0 \end{pmatrix} \tag{7}$$

$$\mathbf{BD} = \begin{pmatrix} 6 \\ 6 \end{pmatrix} \tag{8}$$

$$\tag{9}$$

AREA OF A RHOMBUS;

$$\frac{1}{2}\left\|\mathbf{A}-\mathbf{C}\times\mathbf{B}-\mathbf{D}\right\| \tag{10}$$

$$\frac{1}{2}\begin{vmatrix}-4 & 0\\ -6 & -6\end{vmatrix} \tag{11}$$

$$\frac{1}{2}\left\|24+0\right\| \tag{12}$$

$$\frac{1}{2}\left\|24\right\| \tag{13}$$

$$\frac{12}{1}sq.units \tag{14}$$

$$12sq.units \tag{15}$$

$$therefore the area of the given rhombus is 12sq.units \tag{16}$$