VECTORS

1 10^{th} Maths - EXERCISE-7.3

1. That a median of a triangle divides it into two triangles of equal areas. verify this result for $\triangle ABC$ whose vertices are $\mathbf{A}(4,-6), \mathbf{B}(3,-2)$ and $\mathbf{C}(5,2)$.

2 SOLUTION

Given points are

$$\mathbf{A} = \begin{pmatrix} 4 \\ -6 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} \tag{1}$$

Find the value

$$\mathbf{D} = \frac{\mathbf{B}+\mathbf{C}}{2} \tag{2}$$

$$= \frac{\begin{pmatrix} 3 \\ -2 \end{pmatrix} + \begin{pmatrix} 5 \\ 2 \end{pmatrix}}{2} \tag{3}$$

$$= \frac{\begin{pmatrix} 8 \\ 0 \end{pmatrix}}{2} \tag{4}$$

$$= \begin{pmatrix} 4 \\ 0 \end{pmatrix} \tag{5}$$

Find the value of ar(ABC)

$$ar(ABD) = \frac{1}{2}\begin{vmatrix} 4 & 3 & 4 & 4 \\ -6 & -2 & 0 & -6 \end{vmatrix} \tag{6}$$

$$ar(ABC) = 3 \tag{7}$$

Find the value of ar(ACD)

$$arACD = \frac{1}{2}\begin{vmatrix} 4 & 5 & 4 & 4 \\ -6 & 2 & 0 & -6 \end{vmatrix} \tag{8}$$

$$ar(ACD) = 3 \tag{9}$$

The median of the triangle is both side areas are equal $\triangle ABD = \triangle ACD$

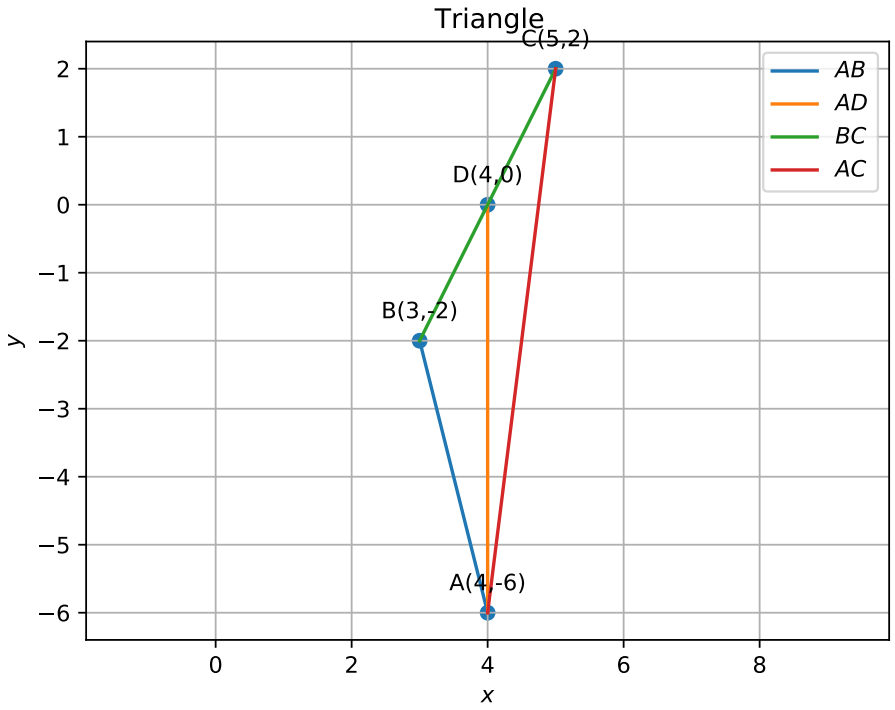

Figure 1: Triangle