1 NCERT 12.10.5.9

Find the position vector of a point C which divides the line joining two points A and B whose Position Vectors are $2\vec{a}+\vec{b}$ and $\vec{a}-3\vec{b}$ externally in the ration $1:2$.Also, Show that A is the mid point of the line segment BC
Solution: The coordinates and ratio are given as

$$\mathbf{A}=\begin{pmatrix}2\\1\end{pmatrix},\mathbf{B}=\begin{pmatrix}1\\-3\end{pmatrix},n=\frac{2}{1} \tag{1}$$

Using section formula

$$\mathbf{C}=\frac{B-n.A}{1-n} \tag{2}$$

$$\mathbf{C}=\frac{\begin{pmatrix}1\\-3\end{pmatrix}-2.\begin{pmatrix}2\\1\end{pmatrix}}{1-2} \tag{3}$$

$$\mathbf{C}=\begin{pmatrix}3\\5\end{pmatrix} \tag{4}$$

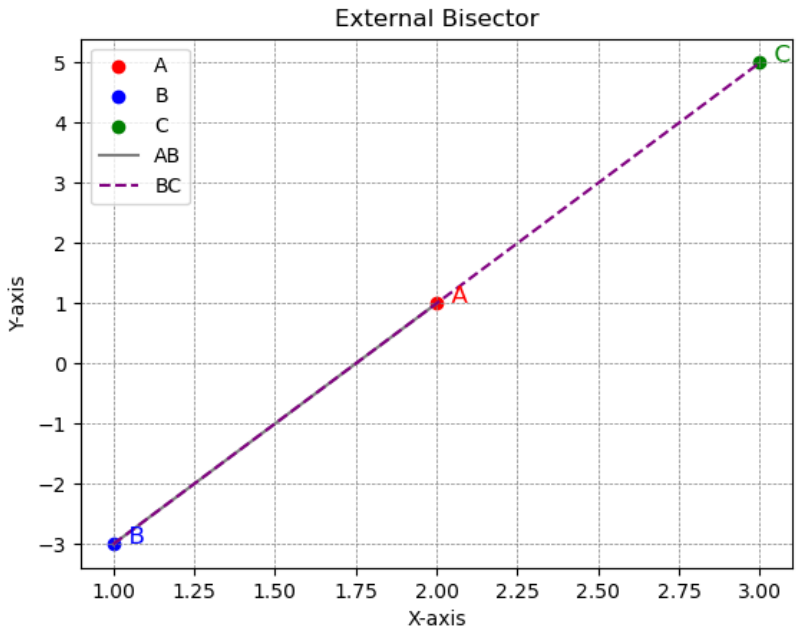

Figure 1: point vectors A,B,C