1.5.35

EE24BTECH11012 - Bhavanisankar G S

QUESTION

The mid-point of segment **AB** is the point **P** 0,4 . If the coordinates of **B** are -2,3 then coordinates of **A** are (10, 2011)

SOLUTION

Coordinates of B = -2,3

Variable name	Description	Formula
A	The point in 2-D plane whose coordinates are to be found.	$\mathbf{M} = \frac{\mathbf{A}+\mathbf{B}}{2}$
B	The point in 2-D plane with coordinates -2,3	$B = (-2, 3$
M	The midpoint of the line-segment AB with coordinates 0,4	$M = (0, 4)$ A

TABLE 0: Variables Used

Coordinates of midpoint (*sayM*) = 0,4

We know that the mid-point of two points, which can be treated as vectors **A** and **B** is

$$\begin{aligned} \mathbf{M} &= \frac{\mathbf{A}+\mathbf{B}}{2} \\ \implies \mathbf{A} &= 2\mathbf{M} - \mathbf{B} \\ &= \begin{pmatrix} 0 \\ 8 \end{pmatrix} - \begin{pmatrix} -2 \\ 3 \end{pmatrix} \\ &= \begin{pmatrix} 2 \\ 5 \end{pmatrix} \end{aligned} \tag{0.1}$$

Hence, the coordinates of point **A** are 2,5 .

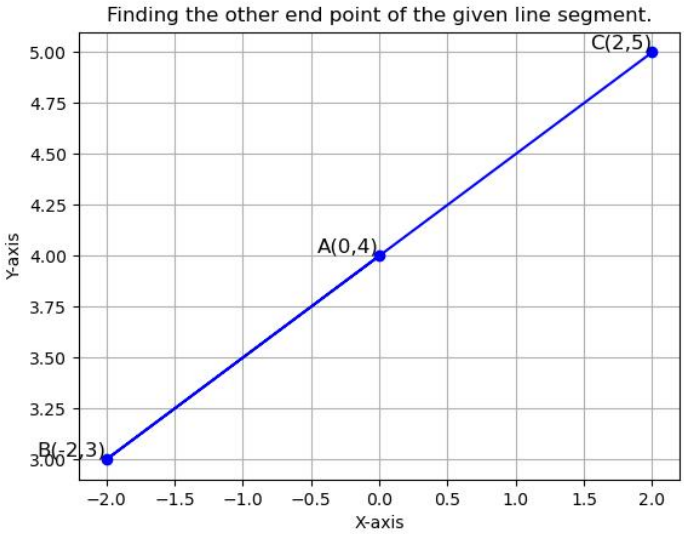

Fig. 0.1: A plot of the given question.