

1.1.5.7

EE24BTECH11008 - Aslin Garvasis

Question: If $A\left(\frac{a}{3}, 4\right)$ is the midpoint of the line segment joining the points $B(-6, 5)$ and $C(-2, 3)$, then the value of a is

solution:

Variable	Description
$B(-6, 5)$	coordinates of first point
$C(-2, 3)$	coordinates of second point
A	midpoint of B and C
k	ratio in which c divides the line joining AB
$\frac{C+kB}{k+1}$	section formula

TABLE 0: Variables Used

$$A = \frac{B + C}{2} \quad (0.1)$$

$$\Rightarrow A = \frac{\begin{pmatrix} -6 \\ 5 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix}}{2} = \frac{\begin{pmatrix} -8 \\ 8 \end{pmatrix}}{2} = \begin{pmatrix} -4 \\ 4 \end{pmatrix} \quad (0.2)$$

$$\therefore A = \begin{pmatrix} \frac{a}{3} \\ 4 \end{pmatrix} \quad (0.3)$$

$$\Rightarrow a = -4 \times 3 \quad (0.4)$$

$$a = -12 \quad (0.5)$$

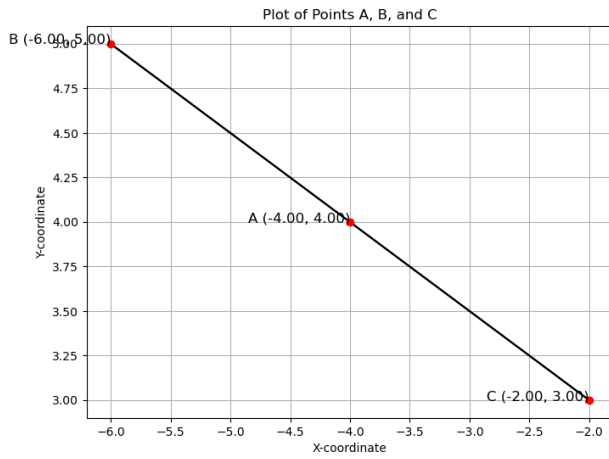


Fig. 0.1: Plot of points A, B and C