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 $B\left(-6, 5\right)$ and $C\left(-2, 3\right)$, then the value of a is

solution:

Variable	Description	formula
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	$\frac{\mathbf{B}+k\mathbf{A}}{k+1}$

TABLE 0: Variables Used

$$A = \frac{k\mathbf{C} + \mathbf{B}}{k + 1} \tag{0.1}$$

where k is the ratio,here k=1

$$A = \frac{\mathbf{B} + \mathbf{C}}{2} \tag{0.2}$$

$$\implies A = \frac{\begin{pmatrix} -6 \\ 5 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix}}{2} = \frac{\begin{pmatrix} -8 \\ 8 \end{pmatrix}}{2} = \begin{pmatrix} -4 \\ 4 \end{pmatrix} \tag{0.3}$$

$$\because A = \begin{pmatrix} \frac{a}{3} \\ 4 \end{pmatrix} \tag{0.4}$$

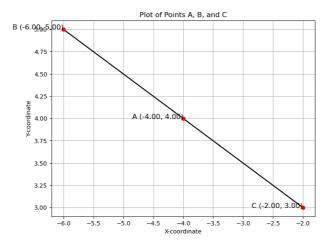$$\implies a = -4 \times 3 \tag{0.5}$$

$$a = -12 \tag{0.6}$$

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