1.1.5.7

EE24BTECH11008 - Aslin Garvasis

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

Solution: As $\mathbf{A}$ is the midpoint of $\mathbf{B}$ and $\mathbf{C}$, $\mathbf{A}$ can be represented as

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

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

also,

$$\mathbf{A} = \begin{pmatrix} \frac{a}{3} \\ 4 \end{pmatrix}$$

$$\implies a = -4 \times 3 = -12 \tag{0.1}$$

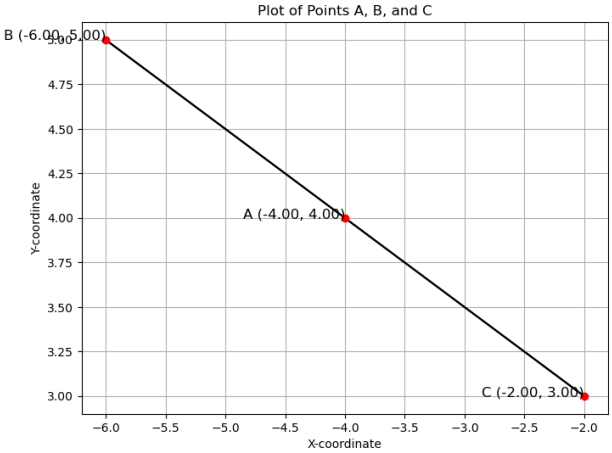

Fig. 0.1: Plot of points **A**, **B** and **P**