

# Question-1-1.5-17

EE24BTECH11038 - MALAKALA BALA SUBRAHMANYA ARAVIND

## Question:

The midpoint of line segment joining **A**  $(2a, 4)$  and **B**  $(-2, 3b)$  is **C**  $(1, 2a + 1)$ . Find the values of  $a$  and  $b$ .

## Solution:

Point	Coordinates
<b>A</b>	$(2a, 4)$
<b>B</b>	$(-2, 3b)$
<b>C</b>	$(1, 2a + 1)$

TABLE 0: variables used

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

Now substituting the values of **A**, **B** and **C**

$$\begin{pmatrix} 1 \\ 2a + 1 \end{pmatrix} = \frac{\begin{pmatrix} 2a \\ 4 \end{pmatrix} + \begin{pmatrix} -2 \\ 3b \end{pmatrix}}{2} \quad (0.2)$$

$$\begin{pmatrix} 1 \\ 2a + 1 \end{pmatrix} = \begin{pmatrix} a - 1 \\ 4 + \frac{3b}{2} \end{pmatrix} \quad (0.3)$$

$$a - 1 = 1 \quad (0.4)$$

$$\implies a = 2 \quad (0.5)$$

$$2a + 1 = a + \frac{3b}{2} \quad (0.6)$$

$$\implies b = 2 \quad (0.7)$$

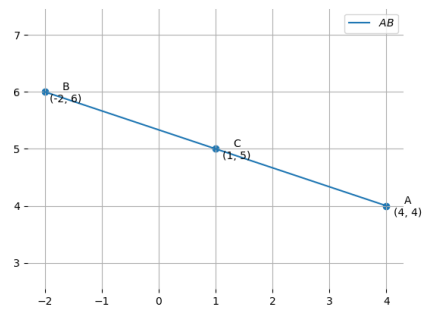


Fig. 0.1: Line **AB**