1.1.9.28

EE24BTECH11059 - Yellanki Siddhanth

Question:
If **A** and **B** are the points $(-6, 7)$ and $(-1, -5)$ respectively, then the distance **2AB** is equal to
Solution:

Variable	Description	Formula
A	A Point to be plotted	$A = \begin{pmatrix} -6 \\ 7 \end{pmatrix}$
B	A Point to be plotted	$B = \begin{pmatrix} -1 \\ -5 \end{pmatrix}$

TABLE 0

To calculate the distance AB,

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} -6 \\ 7 \end{pmatrix} - \begin{pmatrix} -1 \\ -5 \end{pmatrix} = \begin{pmatrix} -5 \\ 12 \end{pmatrix} \tag{0.1}$$

$$\|\mathbf{A} - \mathbf{B}\|^2 = (\mathbf{A} - \mathbf{B})^\top (\mathbf{A} - \mathbf{B}) \tag{0.2}$$

$$(\mathbf{A} - \mathbf{B})^\top (\mathbf{A} - \mathbf{B}) = \begin{pmatrix} -5 & 12 \end{pmatrix} \begin{pmatrix} -5 \\ 12 \end{pmatrix} = 169 \tag{0.3}$$

Thus the distance AB is,

$$\|\mathbf{A} - \mathbf{B}\| = \sqrt{169} = 13 \tag{0.4}$$

$\therefore$ Required value is:

$$\mathbf{2AB} = 26 \tag{0.5}$$

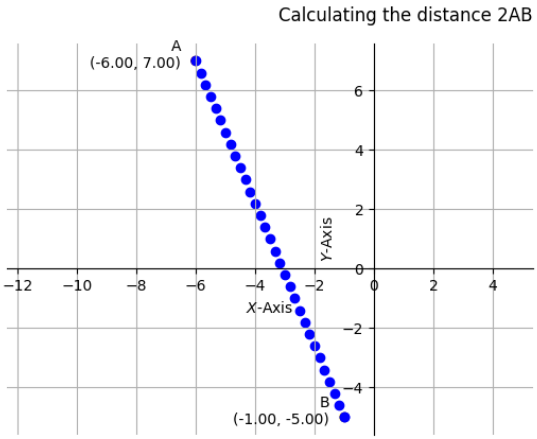
Calculating the distance 2AB
A
(-6.00, 7.00)
B
(-1.00, -5.00)
X-Axis
Y-Axis
6
4
2
0
−2
−4
−12
−10
−8
−6
−4
−2
0
2
4

Fig. 0.1