

1.9.10

EE24BTECH11020 - Ellanti Rohith

Question: The distance between the points $\mathbf{A} \begin{pmatrix} 0 \\ 6 \end{pmatrix}$ and $\mathbf{B} \begin{pmatrix} 0 \\ -2 \end{pmatrix}$ is _____

Solution: We know that distance between two points \mathbf{A} and \mathbf{B} is $\sqrt{(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B})}$

$$\therefore \mathbf{A} - \mathbf{B} = \begin{pmatrix} 0 \\ 6 \end{pmatrix} - \begin{pmatrix} 0 \\ -2 \end{pmatrix} = \begin{pmatrix} 0 \\ 8 \end{pmatrix}, \quad (0.1)$$

$$\sqrt{(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B})} = \sqrt{\begin{pmatrix} 0 & 8 \end{pmatrix} \begin{pmatrix} 0 \\ 8 \end{pmatrix}} = \sqrt{0 + 64} = 8 \quad (0.2)$$

Thus, the desired distance is \mathbf{A} and \mathbf{B} is 8 units.

