1.9.10

EE25BTECH11021 - Dhanush sagar

question(1.9.10) :

$$\text{The distance between the point} \mathbf{A} = \begin{pmatrix} 0 \\ 6 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ -2 \end{pmatrix} is \quad (0.1)$$

solution :

$$\text{Let } \mathbf{A} = \begin{pmatrix} 0 \\ 6 \end{pmatrix}, \quad \mathbf{B} = \begin{pmatrix} 0 \\ -2 \end{pmatrix}. \quad (0.2)$$

$$\text{The distance between } \mathbf{A} \text{ and } \mathbf{B} \text{ is } d(\mathbf{A}, \mathbf{B}) = \|\mathbf{A} - \mathbf{B}\|_2. \quad (0.3)$$

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} 0 \\ 6 \end{pmatrix} - \begin{pmatrix} 0 \\ -2 \end{pmatrix} = \begin{pmatrix} 0 \\ 8 \end{pmatrix}. \quad (0.4)$$

$$\|\mathbf{A} - \mathbf{B}\|_2 = \sqrt{(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B})}. \quad (0.5)$$

$$= \sqrt{\begin{pmatrix} 0 & 8 \end{pmatrix} \begin{pmatrix} 0 \\ 8 \end{pmatrix}} = \sqrt{0^2 + 8^2} = \sqrt{64}. \quad (0.6)$$

conclusion : The distance between **A** and **B** is = 8. \quad (0.7)

Distance between A and B