Assignment-1

Chaithanya - EE22BTECH11045

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1.4.4 Verify that

$$OA = OB = OC \tag{1}$$

Solution: Given

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} \tag{2}$$

$$\mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix} \tag{3}$$

$$\mathbf{C} = \begin{pmatrix} -3 \\ -5 \end{pmatrix} \tag{4}$$

From problem-1.4.2 :

$$O = \begin{pmatrix} \frac{-53}{12} \\ \frac{-5}{12} \end{pmatrix} \tag{5}$$

$$= \begin{pmatrix} -4.4167 \\ 0.4167 \end{pmatrix} \tag{6}$$

1.

$$OA = \sqrt{(\mathbf{O} - \mathbf{A})^\top (\mathbf{O} - \mathbf{A})} \tag{7}$$

$$= \sqrt{\begin{pmatrix} -5.4167 & 1.4167 \end{pmatrix} \begin{pmatrix} -5.4167 \\ 1.4167 \end{pmatrix}} \tag{8}$$

$$= \sqrt{31.3476} \tag{9}$$

$$= 5.5988 \tag{10}$$

2.

$$OB = \sqrt{(\mathbf{O} - \mathbf{B})^\top (\mathbf{O} - \mathbf{B})} \tag{11}$$

$$= \sqrt{\begin{pmatrix} -0.4167 & -5.5833 \end{pmatrix} \begin{pmatrix} -0.4167 \\ -5.5833 \end{pmatrix}} \tag{12}$$

$$= \sqrt{31.3468} \tag{13}$$

$$= 5.5988 \tag{14}$$

3.

$$OC = \sqrt{(\mathbf{O} - \mathbf{C})^\top (\mathbf{O} - \mathbf{C})} \tag{15}$$

$$= \sqrt{\begin{pmatrix} -1.4167 & 5.4167 \end{pmatrix} \begin{pmatrix} -1.4167 \\ 5.4167 \end{pmatrix}} \tag{16}$$

$$= \sqrt{31.3476} \tag{17}$$

$$= 5.5988 \tag{18}$$

From above,

$$OA = OB = OC \tag{19}$$

Hence verified.