

ASSIGNMENT 7

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Download all python codes from

<https://github.com/Atlakeerthana/Assignment7/tree/main/Assignment7>

and latex-tikz codes from

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$$\Rightarrow 2x^2 + 2y^2 + 2z^2 - 4x - 14y + 4z + 109 - 2k^2 = 0 \quad (2.0.6)$$

\therefore the required equation is

$$2x^2 + 2y^2 + 2z^2 - 4x - 14y + 4z + 109 - 2k^2 = 0 \quad (2.0.7)$$

1 QUESTION No 2.25(VECTOR FORMS)

Find the equation of set of points P such that

$$(PA)^2 + (PB)^2 = 2k^2; \quad (1.0.1)$$

$$\mathbf{A} = \begin{pmatrix} 3 \\ 4 \\ 5 \end{pmatrix}; \quad (1.0.2)$$

$$\mathbf{B} = \begin{pmatrix} -1 \\ 3 \\ -7 \end{pmatrix}; \quad (1.0.3)$$

respectively.

2 SOLUTION

Given ,

$$\mathbf{A} = \begin{pmatrix} 3 \\ 4 \\ 5 \end{pmatrix}; \quad (2.0.1)$$

$$\mathbf{B} = \begin{pmatrix} -1 \\ 3 \\ -7 \end{pmatrix}; \quad (2.0.2)$$

Let

$$\mathbf{P} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}; \quad (2.0.3)$$

The given equation is

$$(PA)^2 + (PB)^2 = 2k^2 \quad (2.0.4)$$

so,

$$\Rightarrow (x-3)^2 + (y-4)^2 + (z-5)^2 + (x+1)^2 + (y-3)^2 + (z+7)^2 = 2k^2 \quad (2.0.5)$$