4.3.43

EE25BTECH11052 - Shriyansh Kalpesh Chawda

Question:
Find the equation of the line that passes through the points (3, -2, -5), (3, -2, 6).
Solution:

Problem. Find the equation of the line through $P_1(3,-2,-5)$ and $P_2(3,-2,6)$.

Solution.

$$P_1 = \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix}, \quad P_2 = \begin{pmatrix} 3 \\ -2 \\ 6 \end{pmatrix}, \quad \mathbf{d} = P_2 - P_1 = \begin{pmatrix} 0 \\ 0 \\ 11 \end{pmatrix} \sim \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}.$$

Hence a parametric (affine) description of the line is :

$$\mathbf{x} = \mathbf{p} + \lambda \mathbf{d} = \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix} + \lambda \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}, \qquad \lambda \in \mathbb{R}.$$

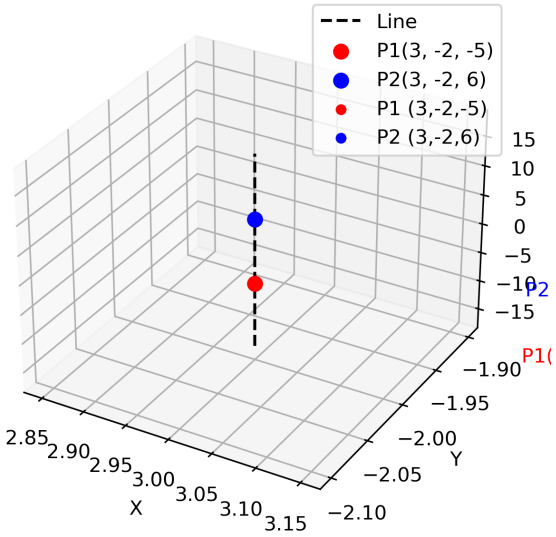

Fig. 0.1