

12.11.2.9

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CLASS 12, CHAPTER 11, EXERCISE 2.9

Q.9. Find the vector equation of the line that passes through the points $\begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix}, \begin{pmatrix} 3 \\ -2 \\ 6 \end{pmatrix}$. **Solution:** The given points are

$$\mathbf{a} = \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix} \quad (1)$$

$$\mathbf{b} = \begin{pmatrix} 3 \\ -2 \\ 6 \end{pmatrix} \quad (2)$$

The equation of line through \mathbf{a} and \mathbf{b} is given by,

$$\mathbf{r} = \mathbf{a} + \lambda(\mathbf{b} - \mathbf{a}) \quad (3)$$

$$\Rightarrow \mathbf{r} = \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ -2 \\ 6 \end{pmatrix} - \lambda \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix} \quad (4)$$

$$\Rightarrow \mathbf{r} = \begin{pmatrix} 3 \\ -2 \\ -5 \end{pmatrix} + \lambda \begin{pmatrix} 0 \\ 0 \\ 11 \end{pmatrix} \quad (5)$$