4.7.62

AI25BTECH11001 - ABHISEK MOHAPATRA

Question: Find the equation of the plane which passes through the point (5,2,-4) and perpendicular the line with direction ratios 2,3,-1.

Solution: let the equation of the plane be

$$\mathbf{n}^\top \mathbf{x} = c \tag{1}$$

as per the question, $\mathbf{n} = \begin{pmatrix} 2 \\ 3 \\ -1 \end{pmatrix}$ and a point ,let $\mathbf{P} = \begin{pmatrix} 5 \\ 2 \\ -4 \end{pmatrix}$

so putting the values in the equation,

$$\begin{pmatrix} 2 \\ 3 \\ -1 \end{pmatrix}^\top \begin{pmatrix} 5 \\ 2 \\ -4 \end{pmatrix} = c \tag{2}$$

$$\implies c = 10 + 6 + 4 = 20 \tag{3}$$

so the required equation is

$$\begin{pmatrix} 2 & 3 & -1 \end{pmatrix} \mathbf{x} = 20 \tag{4}$$

Graph: