

9. Find the equations of any line which is contained on the plane $2x + 3y + z = 6$.

$P = (3, 0, 0)$ is on the plane

$Q = (0, 2, 0)$ is on the plane

So the line joining P and Q is on the plane

$$\vec{PQ} = -3\vec{i} + 2\vec{j}$$

So the line joining PQ is

$$\begin{cases} x = 3 - 3t \\ y = 2t \\ z = 0 \end{cases}$$

10. Find the equation of any plane which contains the line

$$\begin{cases} x = 2 + 3t \\ y = 4 - 2t \\ z = 5 - 4t \end{cases}$$

I choose the plane which contains $(2, 4, 5)$ $\vec{u} = 3\vec{i} - 2\vec{j} - 4\vec{k}$ and $\vec{v} = \vec{i}$

$$\vec{u} \times \vec{v} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 3 & -2 & -4 \\ 1 & 0 & 0 \end{vmatrix} = -4\vec{j} + 2\vec{k}$$

My plane is $-4(y - 4) + 2(z - 5) = 0$

$$-4y + 2z = -6$$



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