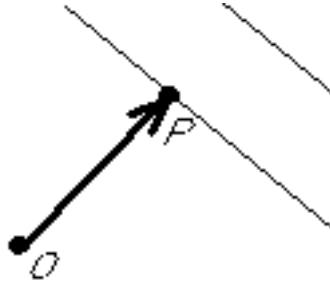


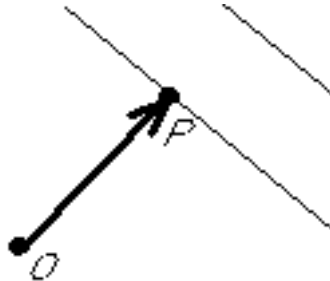
Page 477, #35(b)

1 p477, #35(b), §1 Asked

Asked: The line through point P_0 , $(2,-3,5)$, and parallel to the line $x - y + 2z + 4 = 0$, $2x + 3y + 6z - 12 = 0$.



2 p477, #35(b), §2 Identification



- I need a vector in the direction of the desired line.
- This is the same direction as the given line.
- The two equations give me vectors \vec{n}_1 and \vec{n}_2 normal to the given line
- Cross the two vectors!

3 p477, #35(b), §3 Solution

$$x - y + 2z + 4 = 0 \quad \implies \quad \vec{n}_1 = (1, -1, 2)$$

$$2x + 3y + 6z - 12 = 0 \quad \implies \quad \vec{n}_2 = (2, 3, 6)$$

$$\vec{s} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & -1 & 2 \\ 2 & 3 & 6 \end{vmatrix} = \begin{pmatrix} -12 \\ -2 \\ 5 \end{pmatrix}$$

$$\vec{r} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 2 \\ -3 \\ 5 \end{pmatrix} + \mu \begin{pmatrix} -12 \\ -2 \\ 5 \end{pmatrix}$$

Alternatively:

$$\frac{x-2}{-12} = \frac{y+3}{-2} = \frac{z-5}{5} (= \mu)$$