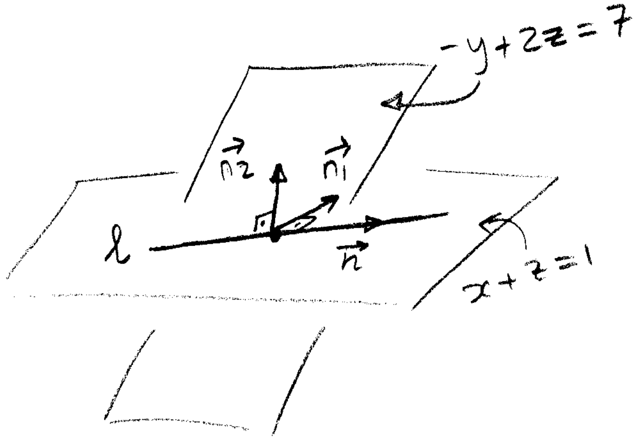
(4) (a) $-y + 2z = 7 \rightsquigarrow \vec{n}_1 = \langle 0, -1, 2 \rangle$ is a normal vector.

$x + z = 1 \rightsquigarrow \vec{n}_2 = \langle 1, 0, 1 \rangle$ is a normal vector.

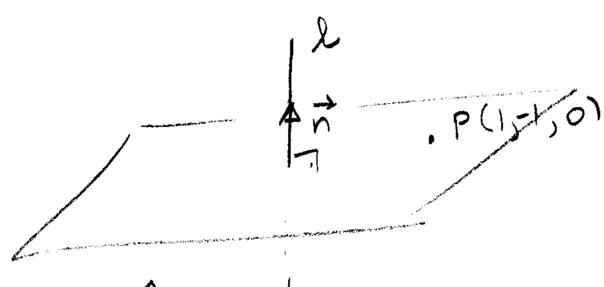


We can take

$\vec{n} = \vec{n}_1 \times \vec{n}_2$
$= -\hat{i} + 2\hat{j} + \hat{k}$.

as a vector parallel to ℓ

(b)



$\vec{n} = -\hat{i} + 2\hat{j} + \hat{k}$
(from (a))

An equation of this plane is

$\underset{\langle -1, 2, 1 \rangle}{\underset{\parallel}{\vec{n}}} \circ \langle x-1, y+1, z \rangle = 0$

$\iff -(x-1) + 2(y+1) + z = 0$

OR $\quad -x + 2y + z + 3 = 0$

(c) $\vec{v} = \langle 2, 1, 0 \rangle$ and $\vec{n} = \langle -1, 2, 1 \rangle$.

$\vec{v} \circ \vec{n} = \langle 2, 1, 0 \rangle \circ \langle -1, 2, 1 \rangle = 0$

So the component of $\vec{v} = \langle 2, 1, 0 \rangle$ which is perpendicular to $\vec{n}$ is $\vec{0}$.