Quiz 5

1. direction $\bar{v}$ is $\langle 2, -3, 1 \rangle$ so

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1+2t \\ 1-3t \\ 5+t \end{pmatrix}$$

2. $4(x-1)+5(y-4)+(z-2)=0 \Rightarrow$

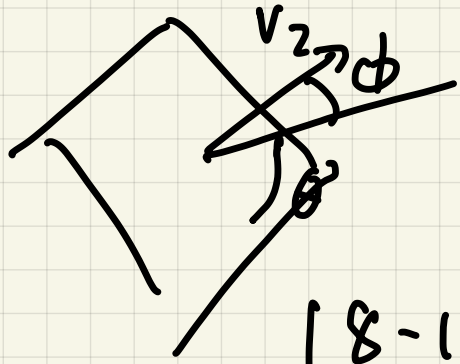
$$4x+5y+z=26$$

3. $4(1+2t)+5(1-3t)+(5+t)=26$

$8t+4-15t+5+t+5=26$

$-6t=12 \Rightarrow t=-2$, so $P=(-3,7,3)$

4.



If ϕ is angle between $\bar{v}_2$ and L_1, then

$$\cos\phi = \frac{|\langle 2,-3,1\rangle \cdot \langle 4,5,1\rangle|}{|\langle 2,-3,1\rangle||\langle 4,5,1\rangle|} =$$

$$\frac{|8-15+1|}{\sqrt{14}\sqrt{42}} = \frac{6}{14\sqrt{3}} = \frac{3}{7\sqrt{3}} = \frac{\sqrt{3}}{7}$$

$$\cos\theta = \sin\phi = \sqrt{1-\cos^2\phi} = \sqrt{1-\frac{3}{49}} = \frac{\sqrt{46}}{7}$$