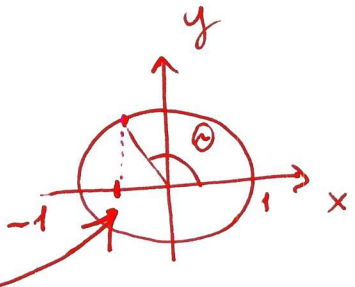
Section 11.5
Problem 92

a) $n_1 = 6i - 3j + k \qquad n_2 = -i + j + 5k$



$$\cos\theta = \frac{n_1 \cdot n_2}{\|n_1\| \cdot \|n_2\|} = \frac{-4}{\sqrt{46}\sqrt{27}}$$

$$\theta = 180° - \arccos\left(\frac{4}{\sqrt{46}\sqrt{27}}\right) \approx 96.52°$$

or $83.48°$ as it is angle between planes.

b) The direction vector for the line is

$$n_1 \times n_2 = \begin{vmatrix} i & j & k \\ 6 & -3 & 1 \\ -1 & 1 & 5 \end{vmatrix} = (-16, -31, 3)$$

Find a point of intersection of the planes:

$$\left.\begin{aligned} 6x - 3y + z &= 5 \\ -x + y + 5z &= 5 \end{aligned}\right\} \Rightarrow \begin{aligned} 6x - 3y + z &= 5 \\ -6x + 6y + 30z &= 5 \\ \hline 3y + 31z &= 35 \end{aligned}$$

Let $y = -9$, $z = 2 \Rightarrow x = -4$ We have $(-4, -9, 2)$

Parametric equations:

$$x = -4 - 16t, \quad y = -9 - 31t, \quad z = 2 + 3t$$

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Put (x, y, z) on equal distance from $(1,0,2)$ and $(2,0,1)$

$$\sqrt{(x-1)^2+(y-0)^2+(z-2)^2} = \sqrt{(x-2)^2+(y-0)^2+(z-1)^2}$$

.....

$x - z = 0$ - Plane