ASSIGNMENT

Shristy Sharma (EE22BNITS11001)

1 PROBLEM

1. If the lines $\frac{x-1}{-3} = \frac{y-2}{2k} = \frac{z-3}{2}$ and $\frac{x-1}{3k} = \frac{y-1}{1} = \frac{z-6}{-5}$ are perpendicular, find the value of k.

2 SOLUTION:

Direction vectors are:

$$\begin{pmatrix} -3 \\ 2k \\ 2 \end{pmatrix} \text{and} \begin{pmatrix} 3k \\ 1 \\ -5 \end{pmatrix} \quad (2.0.1)$$

$$\implies (-3)(3k) + (2k)(1) + (2)(-5) = 0 \quad (2.0.2)$$

$$\implies -9k + 2k - 10 = 0 \quad (2.0.3)$$

$$\implies -7k - 10 = 0 \quad (2.0.4)$$

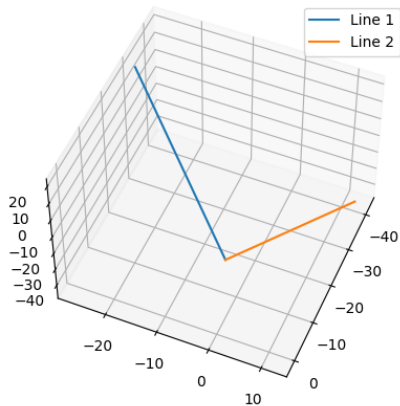$$\implies k = \frac{-10}{7} \quad (2.0.5)$$

Fig. 0: lines represented for the given points and direction vector with k=$\frac{-10}{7}$