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:

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

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

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

$$-7k - 10 = 0 \tag{2.0.4}$$

$$k = \frac{-10}{7} \tag{2.0.5}$$

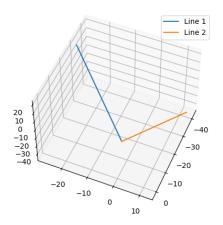


Fig. 0: lines represented for the given points and direction vector with $k=\frac{-10}{7}$