

ASSIGNMENT

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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:

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

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

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

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

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

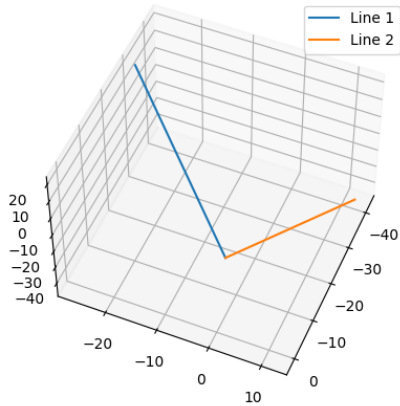


Fig. 0: lines represented for the given points and direction vector with $k = \frac{-10}{7}$