**9E Points of Intersection**

1. The lines $l\_{1}$ and $l\_{2}$ have vector equations:

$$r=\left(\begin{matrix}3\\1\\1\end{matrix}\right)+λ\left(\begin{matrix}1\\-2\\-1\end{matrix}\right)$$

and

$$r=\left(\begin{matrix}0\\-2\\3\end{matrix}\right)+μ\left(\begin{matrix}-5\\1\\4\end{matrix}\right)$$

Show that the lines intersect, and find their point of intersection.

1. Find the coordinates of the point of intersection of the line $l$ and the plane $Π$ where $l$ has equation:

$$r=-i+j-5k+λ(i+j+2k)$$

And $Π$ has equation:

$$r.\left(i+2j+3k\right)=4$$

1. The lines $l\_{1}$ and $l\_{2}$ have equations:

$$\frac{x-2}{4}=\frac{y+3}{2}=z-1$$

and

$$\frac{x+1}{5}=\frac{y}{4}=\frac{z-4}{-2}$$

respectively.

Prove that $l\_{1}$ and $l\_{2}$ are skew.