24
37

5. **(There is no partial credit for this problem. Make sure your answer is correct.)** Find the equations of the line through $(-1,2,4)$ and $(2,-3,6)$.

$P_1 =$ $P_2 =$

$\overrightarrow{P_1P_2} = 3\vec{i} - 5\vec{j} + 2\vec{k}$

$$\begin{cases} x+1 = 3t \\ y-2 = -5t \\ z-4 = 2t \end{cases}$$

6. Do the following lines intersect? If so, find their point of intersection.

$$\frac{x-3}{1} = \frac{y+1}{-2} = \frac{z-10}{3} \quad \text{and} \quad \frac{x+2}{-1} = \frac{y-6}{1} = \frac{z+2}{-2}$$

The 1st line is $*\begin{cases} x = 3+t \\ y = -1-2t \\ z = 10+3t \end{cases}$

If a creature walks on the first line according to *, then the creature is also on the second line when

$$\frac{3+t+2}{-1} = \frac{-1-2t-6}{1} = \frac{10+3t+2}{-2}$$

that is $\begin{cases} -5 - t = -7-2t \\ -5 - t = -4 - \frac{3}{2}t \end{cases}$ so $t = -2$

the point of intersection is $(1, 3, 4)$