Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work **correct**, **complete** and **coherent**.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 8, September 30, 2019

Find the point of intersection of the two lines

$$\begin{cases} x = 3 - t \\ y = 3 + 2t \\ z = 10 + 5t \end{cases} \quad \text{and} \quad \begin{cases} x = 6 + s \\ y = 5 + 2s \\ z = 11 + 3s. \end{cases}$$

ANSWER: The equations on the left give the position of object one at time t. The equations on the right give the position of object two at time t. We look for a time t_0 and a time s_0 with the position of object one at time t_0 equal to the position of object two at time s_0.

We solve

$$\begin{cases} 3 - t_0 = 6 + s_0 \\ 3 + 2t_0 = 5 + 2s_0 \\ 10 + 5t_0 = 11 + 3s_0 \end{cases}$$

simultaneously. We solve

$$\begin{cases} -3 - t_0 = s_0 \\ 3 + 2t_0 = 5 + 2(-3 - t_0) \\ 10 + 5t_0 = 11 + 3(-3 - t_0) \end{cases}$$

simultaneously. We solve

$$\begin{cases} -3 - t_0 = s_0 \\ 4t_0 = 5 + 2(-3) - 3 \\ 8t_0 = 11 + 3(-3) - 10 \end{cases}$$

simultaneously. We solve

$$\begin{cases} -3 - t_0 = s_0 \\ 4t_0 = -4 \\ 8t_0 = -8 \end{cases}$$

simultaneously. So, $t_0 = -1$ and $s_0 = -2$. The point is $\boxed{(4,1,5).}$