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 6, February 5, 2020

Find the point where the line
$$\begin{cases} x = 1 - t \\ y = 3t \\ z = 1 + t \end{cases}$$
meets the plane $2x - y + 3z = 6$.

ANSWER: Plug the parametric equations for the line into the equation for the plane to find out WHEN the line hits the plane:
$$2(1 - t) - (3t) + 3(1 + t) = 6$$
$$2 - 2t - 3t + 3 + 3t = 6$$
$$-2t = 1$$
$$t = -1/2.$$

Now find out WHERE the line is at time $t = -1/2$:
$$\begin{cases} x = 1 - (-1/2) = 3/2 \\ y = 3(-1/2) = -3/2 \\ z = 1 + (-1/2) = 1/2. \end{cases}$$

The point of intersection is $\boxed{(3/2, -3/2, 1/2)}$.

Check: The proposed answer is on the plane because when $(3/2, -3/2, 1/2)$ is plugged into the equation of the plane, one gets
$$2(3/2) - (-3/2) + 3(1/2) = (1/2)(6 + 3 + 3) = 6.\checkmark$$

The proposed answer is on the line because when $t = -1/2$, then the parametric equations give
$$\begin{cases} x = 1 - (-1/2) = 3/2 \\ y = 3(-1/2) = -3/2 \\ z = 1 + (-1/2) = 1/2 \end{cases}$$
and this is the point $(3/2, -1/2, 1/2)\checkmark$