Quiz 3; Wednesday, February 10
MATH 53 with Professor Stankova
Section 109; 11-12
GSI: Eric Hallman

Student name:

You have 10 minutes to complete the quiz. Calculators are not permitted, and remember to show your calculations and explain your reasoning in order to receive full credit.

1. Determine whether the lines L_1 and L_2 are parallel, skew, or intersecting. If they intersect, find the point of intersection.

$$L_1 = \langle 3, 4, 1\rangle + t\langle 2, -1, 3\rangle$$
$$L_2 = \langle 1, 3, 4\rangle + s\langle 4, -2, 5\rangle$$

The vectors $\langle 2, -1, 3\rangle$ and $\langle 4, -2, 5\rangle$ are not multiples of each other, so the lines are not parallel. If the lines intersect, then the vectors v, u, and $v_0 - u_0$ will all lie in the same plane and so their triple product will be zero. So check this:

$$\begin{vmatrix} 2 & -1 & 3 \\ 2 & 1 & -3 \\ 4 & -2 & 5 \end{vmatrix} = 2(-1) + 1(22) + 3(-8) = -4,$$

so the lines do not intersect. They are therefore skew.