Quiz 1

Math 54-Lec 3, Linear Algebra, Fall 2017

SECTION: NAME:

You have 30 minutes to complete this quiz. To receive full credit, you must justify your answers.

Problem 1.(5 points.) Solve the system of linear equations below.

$$\begin{aligned} 2x_1 \qquad - 6x_3 &= -8 \\ x_2 + 2x_3 &= 3 \\ 3x_1 + 6x_2 - 2x_3 &= -4 \end{aligned}$$

Problem 2.(5 points.) For $\vec{v_1}, \vec{v_2}, \vec{v_3}$ below, find all constants c_1, c_2, c_3 that satisfy $c_1\vec{v_1}+c_2\vec{v_2}+c_3\vec{v_3} = \vec{0}$. Hence, are the vectors linearly independent or linearly dependent?

$$\vec{v_1} = \begin{bmatrix} -4 \\ 0 \\ 1 \end{bmatrix}, \vec{v_2} = \begin{bmatrix} -3 \\ -1 \\ 1 \end{bmatrix} \vec{v_3} = \begin{bmatrix} 0 \\ 5 \\ -5 \end{bmatrix}$$

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Problem 3.(5 points.) For what values of c, a real number, does the following system of equations have infinitely many solutions?

$$\begin{aligned} 2x_1 + 5x_2 &= 6 \\ x_1 + cx_2 &= 3 \end{aligned}$$