Math 54 Quiz 3 September 11, 2015

Box your final answer. No calculators or phones. Keep your quiz until the end.

Name and section: _____

1. (5 points) Which of the following sets of vectors in $\mathbb{R}^3$ contain two linearly independent vectors but no more?

$$\left\{\begin{bmatrix} 0 \\ 8 \\ -6 \end{bmatrix}, \begin{bmatrix} 0 \\ -11 \\ 9 \end{bmatrix}\right\}, \left\{\begin{bmatrix} 0 \\ 8 \\ -6 \end{bmatrix}, \begin{bmatrix} 0 \\ -12 \\ 9 \end{bmatrix}\right\}, \left\{\begin{bmatrix} 3 \\ 5 \\ -2 \end{bmatrix}, \begin{bmatrix} 0 \\ 8 \\ -6 \end{bmatrix}, \begin{bmatrix} -3 \\ 3 \\ -4 \end{bmatrix}\right\}$$

2. (5 points) Does $\begin{bmatrix} 4 \\ -3 \\ 5 \end{bmatrix}$ lie in the span of $\begin{bmatrix} 2 \\ -5 \\ -3 \end{bmatrix}$ and $\begin{bmatrix} -7 \\ 12 \\ -5 \end{bmatrix}$? Deduce whether or not the system

$$\begin{aligned} 2x_1 - 7x_2 &= 4 \\ -5x_1 + 12x_2 &= -3 \\ -3x_1 - 5x_2 &= 5 \end{aligned}$$

has a solution.