Name_____

Student I.D._____

Math 2250-010
Quiz 5
February 21, 2014

1a) Define what a linear combination of vectors $\underline{\boldsymbol{v}}_1, \underline{\boldsymbol{v}}_2, \ldots \underline{\boldsymbol{v}}_n$ is.

(2 points)

1b) Define what the span of a collection of vectors $\underline{\boldsymbol{v}}_1, \underline{\boldsymbol{v}}_2, \ldots \underline{\boldsymbol{v}}_n$ is.

(2 points)

2) The span of the vectors

$$\underline{\boldsymbol{u}} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \ \underline{\boldsymbol{v}} = \begin{bmatrix} 2 \\ 3 \\ 4 \end{bmatrix}$$

is a plane in $\mathbb{R}^3$. Find for which $[x, y, z]^T$ the system

$$c_1\underline{\boldsymbol{u}} + c_2\underline{\boldsymbol{v}} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

can be solved for c_1, c_2, in order to find the implicit equation $a\,x + b\,y + c\,z = d$ of this plane. Hint: write down the augmented matrix for this system with unknowns c_1, c_2, reduce it, and interpret your results.

(6 points)