MATH 544 **Quiz #2** **Name:**______________________

Spring, 2009

1. For which value(s) of h will $\mathbf{y} = \begin{bmatrix} -4 \\ 3 \\ h \end{bmatrix}$ be in $\operatorname{span}(\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3\})$ if

$$\mathbf{v}_1 = \begin{bmatrix} 1 \\ -1 \\ -2 \end{bmatrix}, \quad \mathbf{v}_2 = \begin{bmatrix} 5 \\ -4 \\ -7 \end{bmatrix}, \quad \text{and} \quad \mathbf{v}_3 = \begin{bmatrix} -3 \\ 1 \\ 0 \end{bmatrix}?$$

   Assuming that h has an appropriate value, express $\mathbf{y}$ as a linear combination of $\mathbf{v}_1$, $\mathbf{v}_2$, and $\mathbf{v}_3$.

2. In the problem above, can $\mathbf{y}$ be expressed in more than one way as a linear combination of $\mathbf{v}_1$, $\mathbf{v}_2$, and $\mathbf{v}_3$. If so, do it; if not, explain why not.

3. (Bonus) What do the previous results tell us about the independence or dependence of the set $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3\}$?