Please show **all** your work and circle your answer! Please read the questions carefully. You have 15 minutes for this quiz.

Name:_____

1. (3pts) Determine if the columns of the following matrix are linearly independent, if they are linearly dependent, write a nontrivial linear combination of the three vectors that sums to zero:

$$\begin{pmatrix} 0 & 2 & 3 \\ 1 & 3 & 6 \\ -1 & 1 & 0 \end{pmatrix}$$

2. (3pts) From the collection of vectors in $\mathbb{R}^4$, select a subset of them that forms a basis[1] for their span (justify your answer).

$$\left\{ \begin{pmatrix} 1 \\ -3 \\ 2 \\ -4 \end{pmatrix}, \begin{pmatrix} -3 \\ 9 \\ -6 \\ 12 \end{pmatrix}, \begin{pmatrix} 2 \\ -1 \\ 4 \\ 2 \end{pmatrix}, \begin{pmatrix} -4 \\ 5 \\ -3 \\ 7 \end{pmatrix} \right\}$$

[1]Recall: the basis of the span of $\{\vec{v}_1, \ldots, \vec{v}_n\}$ is a collection of linearly independent vectors that span the same space as the span of $\{\vec{v}_1, \ldots \vec{v}_n\}$.

The End.