Name:

**Linear Algebra: Quiz 8**

**Show ALL work, as unjustified answers may receive no credit.** Calculators are not allowed on any quiz or test paper. Make sure to exhibit skills discussed in class. Box all answers and clean up answers as much as possible.

1. ***Coordinate Systems (4.4)***

[4pts] Use the coordinate vectors to determine whether the given polynomials are Linearly Dependent in $\mathbb{P}_2$. Let $\mathcal{B}$ be the Standard Basis of the space $\mathbb{P}_2$ of polynomials, that is $\mathcal{B} = \{ 1, t, t^2 \}$:

$$1 + 2t \ , \qquad 3 + 6t^2 \ , \qquad 1 + 3t + 4t^2$$

2. ***The Dimensions of a Vector (4.5)***

Consider the matrix:

$$A = \begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 5 & -4 \\ 0 & 0 & 1 & -6 & 2 & -2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

(a) [3pts] Find the Basis and Dimension of the Column Space of $A$.

(b) [3pts] Find the Basis and Dimension of the Null Space of $A$.