Name:

MATH 221 BOSS FIGHT 1: BONUS QUIZ ON BASIS FOR COL(A) AND NULL(A) (+20PTS)

A basis is a set of vectors. Write your answers as appropriate sets of vectors. Box your answers.

Problem 1: You are given that:

$$A = \begin{bmatrix} 1 & -3 & 1 & 3 \\ 3 & -9 & 1 & 5 \\ 2 & -6 & 1 & 4 \end{bmatrix} \qquad \text{has} \qquad \text{rref}(A) = \begin{bmatrix} 1 & -3 & 0 & 1 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

(a.) (2pts) Find the basis for Col(A),

(b.) (8pts) Find the basis for Null(A).

Problem 2: You are given that:

$$A = \begin{bmatrix} 1 & -1 & -1 & -1 \\ -2 & 2 & 2 & 2 \end{bmatrix} \qquad \text{has} \qquad \text{rref}(A) = \begin{bmatrix} 1 & -1 & -1 & -1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

(a.) (2pts) Find the basis for Col(A),

(b.) (8pts) Find the basis for Null(A).