Math 304 Spring 2010
3/18/2010
Quiz #8 Name: _____

Show all work clearly and in order. Please box your answers. Use answer lines where provided. 10 minutes.

1. Let $A = \begin{bmatrix} 1 & -1 \\ 0 & 0 \end{bmatrix}$

   (a) Find a basis X for the column space of A.

   (b) What is the dimension of the column space of A?

   (b) _____

   (c) Find a basis Y for the null space of A.

   (d) What is the dimension of the null space of A?

   (d) _____

   (e) Find a basis Z for the row space of A.

   (f) What is the dimension of the row space of A?

   (f) _____

2. $X = \left(\begin{bmatrix} -1 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \end{bmatrix} \right)$ is an ordered basis of $\mathbb{R}^2$. Let K be the coordinate transformation defined by the ordered basis X. The vector $\mathbf{w} = \begin{bmatrix} -2 \\ 1 \end{bmatrix}$ in in $\mathbb{R}^2$. Calculate $K(\mathbf{w})$ (i.e., find the coordinate vector of $\mathbf{w}$ with respect to the ordered basis X).