Math 221-AB1: Quiz 2

1. Consider the following set of vectors.

$$\left\{ \begin{bmatrix} 1 \\ 0 \\ 3 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix} \right\}$$

   (a) (*3 pts*) Find a linear combination of these vectors that equals the vector x.

$$x = \begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix}$$

   (b) (*2 pts*) What is the dimension of the subspace spanned by this set of vectors. Give a reason for your answer.

2. Let $W = \left\{ \begin{bmatrix} a & b & 0 & b \end{bmatrix}^T : a, b \in \mathbb{R} \right\}$

   (a) (*3 pts*) Show that W is a subspace of $\mathbb{R}^4$.

   (b) (*2 pts*) Give a basis for W.