Quiz #6 for Math 250:1 & 5

Name _____ **Section** (please circle one) **1 5**

1. (4) In this problem, $\mathcal{S}$ is a subspace of $\mathbb{R}^n$ which is **not** $\{0\}$.

a) Define *basis of $\mathcal{S}$*.

b) Define *dimension of $\mathcal{S}$*.

2. (3) Suppose S is the subspace of $\mathbb{R}^4$ that is the span of $\left\{ \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ 2 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 2 \\ 0 \\ 2 \\ 0 \end{bmatrix} \right\}$. Find the dimension of S and give a basis of S. You do *not* need to justify your answers.

3. (3) Suppose S is a subspace of $\mathbb{R}^{500}$ which contains a set of 4 linearly independent vectors and which is spanned by 6 of its vectors. What are the possible values of the dimension of S? You do *not* need to justify your answer.