Name:

Linear Algebra II - Quiz 1

All the solutions should be properly justified and explained. Clarity of the presentation will also be rewarded.

The maximal number of points awarded is 10.

We consider the set V of 2×2 matrices S satisfying

$$\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix} S = S \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}.$$

1. Prove that V is a subspace of $M_2(\mathbb{R})$.

2. Determine a basis of V.