Math 225 Quiz 1

Don't forget to write down clearly your **Name**: and **ID number:**

1. True or False (5 points) Mark "T" (True) or "F" (False) in front of each statement.

____ The collection of vectors $\{(x, y) \in \mathbb{R}^2 | y \geq 0\}$ form a subspace of $\mathbb{R}^2$.

____ $\{1, x, x + 1\}$ are three vectors of $P_1(\mathbb{R})$ that are linearly dependent.

____ If U, V are subspaces of a vector space W, then $U \cap V$ is also a subspace.

____ $\{1, x, x^2, x^3\}$ is a basis of $P_3(\mathbb{F})$.

____ If $v_1, \ldots, v_n$ are linearly dependent vectors, then the equation $a_1 v_1 + \cdots + a_n v_n = 0$ only has the solution $(a_1, \ldots, a_n) = (0, \ldots, 0)$.

2. Subspaces (5 points). Please give five different examples of subspaces of the 2×2-matrix algebra $\mathrm{M}(2, \mathbb{F})$ that are not the zero space $\{0\}$ or the entire space itself.