Activity 6

**Question.** $S = \{(x, y)|y = 0\}$. Is $S$ a vector space? Is it a subspace of something we have seen before? Justify your answer completely.

**Question.** $M_{2\times 2}$, the set of $2 \times 2$ matrices a vector space? Is it a subspace of something we have seen before? Justify your answer completely.

**Question.** $W = \{(x, y)|y = x + 1\}$. Is $W$ a subspace of $\mathbb{R}^2$? Is it a vector space? Justify your answer completely.

**Question.** $S = \{(x, y)|x \geq 0, y \geq 0\}$. Draw $S$. Is $S$ a subspace of $\mathbb{R}^2$? Justify your answer completely.

**Question.** Let $W$ be the first and third quadrants in the plane, i.e. $W = \{(x, y)|xy \geq 0\}$. Is $W$ a subspace of $\mathbb{R}^2$? Justify your answer completely.

**Question.** Are either of these vector spaces? Are they subspaces of some other vector space?

- The set of polynomials of degree less than or equal to two.
- The set of all polynomials of exactly degree two.