

Math 3280 Worksheet 17: Vector Spaces

Group members (2 to 4): _____

To be a vector subspace, a subset W must be closed under addition and scalar multiplication: if $w_1 \in W$ and $w_2 \in W$, then for any numbers a and b , $aw_1 + bw_2 \in W$.

- (1) Is the subset $W = \{(x, y) \mid y \geq 0\} \subset \mathbb{R}^2$ a vector subspace of $\mathbb{R}^2$? Explain why or why not.

- (2) Is the subset $W = \{(x, y) \mid y = 0 \text{ or } x = 0\} \subset \mathbb{R}^2$ a vector subspace of $\mathbb{R}^2$? Explain why or why not.

- (3) Is the set of four-by-four skew-symmetric matrices ($A^T = -A$) a vector subspace of the set of all four-by-four matrices with real entries?