

EXERCISE OF SECTION 4.2, 4.3

Question 1. Suppose that $V = \mathbb{R}$, $u \oplus v = u - v$ and $c \odot u = cu$. Is $(V, \oplus; \mathbb{R}, \odot)$ a vector space?

Question 2. Which of the followings are subspaces of \mathbb{R}^2 equipped with the usual vector addition and scalar multiplication?

S1: The line $y = x + 1$.

S2: The line $y = -x$.

S3: The closed upper half space $W = \{(x, y) \in \mathbb{R}^2 : y \geq 0\}$.

S4: The origin, i.e., the point $(0, 0)$.

A. Only S2.

B. Only S1 and S2.

C. Only S2 and S4.

D. Only S1, S2 and S3.

E. None of them.