Quiz 3

Name:

Complete the following definition by completing the statements of all ten conditions.

Definition A *vector space over* $\mathbb{R}$ is a set V equipped with two operations, $+$ and $\cdot$, that satisfy the following conditions for all vectors $\vec{v}, \vec{w}, \vec{u} \in V$ and all scalars $r, s \in \mathbb{R}$:

(1) the set V is closed under vector addition :

(2) vector addition is commutative :

(3) vector addition is associative :

(4) there is a *zero vector* $\vec{0} \in V$ such that

(5) each $\vec{v} \in V$ has an *additive inverse* $\vec{w} \in V$ such that

(6) the set V is closed under scalar multiplication :

(7) addition of scalars distributes over scalar multiplication :

(8) scalar multiplication distributes over vector addition :

(9) ordinary multiplication of scalars associates with scalar multiplication :

(10) multiplication by the scalar 1 is the identity operation :