Vector Spaces

A **vector space** V is a set of objects and two operations for creating new objects in V: addition and multiplication by scalars. i.e. making linear combinations.

We want the operations in V to have all the properties we see in operating with real numbers (i.e. associativity and commutativity of addition, distribution of scalar multiplication over addition, etc.). (See problem 5 on page 74 of the text.)

In the examples of V we give here, $\mathbb{R}$ (the set of real numbers) plays an important underlying role and as a consequence the axioms on page 74 will be satisfied automatically.