



## SCALAR MULTIPLE SETS

### Why

#### Definition

The *scalar multiple* of a subset of a vector space *by* a given scalar is the set of all vectors which are the scalar product of the given scalar and the vector.

The *symmetric reflection* of a subset of a vector space is the scalar multiple by the additive inverse of the field. A subset of a vector space is *symmetric* if it is its own symmetric reflection.

#### Notation

Let  $(V, \mathbf{F})$  be a vector space. Let  $M \subset V$  and  $\lambda \in \mathbf{F}$ . The scalar multiple of  $M$  by  $\lambda$  is the set

$$\{\lambda x \mid x \in M\},$$

which we denote by  $\lambda M$ .

The symmetric reflection of  $M$  is  $(-1)M$  which we denote by  $-M$ .  $M$  is symmetric if  $M = -M$ .

