Vectors

1 Vector space

I assume you know enough about $\mathbb{R}^n$. R^n satisfies some axioms, which we can identify and thus generalize.

We can add any two vectors, and we can multiply vectors by scalars.

Group poperties

Pretty much boring stuff.

Closure
Associativity of addition
Additive Identity
Inverse
Commutativity

Scalars

Getting interesting.

Multplicative Identity
Associativity of multiplication
Distributivity (r+s)X=rX+sX. r(X+Y)=rX+rY.

2 Vector subspace

A vector subspace is a subset of a vector space that is also a vector space.

3 Sum

Suppose $U_1, ...U_m$ are subspaces of V; then

$$U_1 + ...U_m = \{u_1 + ...u_m | u_i \in U_i\} \tag{1}$$

is the sum of all possible sums of elements of U.

4 Span