

#flo #ref #hw

1 | def of a vector space

- Props of addition and scalar multiplication in F^N

- $+$: comutative, associative, identity
 - * every element has an additive inverse
- $*$: associative, identity
- addition and scalar multiplication, connected by distributive props

- let V be a set with an addition and scalar multiplication that satisfy the props,

****addition, scalar multiplication****

- addition: assigns an element $u+v$ in V to each pair of elements u, v in V
- scalar multiplication: lv with l in F and v in V

****vector space****

is V with addition and SCMUL with:

- commutativity
- associativity
- additive idenity
- additive inverse
- multiplicative identity
- distibutive properties

- no multiplicative inverse?

- is this how you solve the 0 issue?

- vec, point

- elements of vec space are called vecs or points

- simplest vec space: $\{0\}$

- F^{fin} is the set of all seqencues of elements of F

- additive identity: seqnece of all zeros

- vector space can include a set of functions? not quite..

- let S be a set, and F^S be the set of functions from S to F
- what?? #review

- let S be the interval $[0,1]$ and $F=R$

- $R^{\setminus[0, \setminus 1]}$ is the set of real valued function on the interval $[0,1]$
- ??

- $F^N \rightarrow F^{1,2,\dots,n}$
- $F^{\text{infin}} \rightarrow F^{1,2,\dots}$
- vector spaces need unique additive inverse
 - $0' = 0' + 0 = 0 + 0' = 0$
 - * nicer than my proof
- unique additive inverse
 - $w = w + 0 = w + (v + w') = (w + v) = (w + v) + w' = 0 + w' = w'$

V denotes a vector space over F

1. no multiplicative inverse required?
2. what does the set of functions from S to F mean?

1.1 | exercises

1. prove that $-(-v) = v$
 - (a) $-(-v) = -1(-1v) = (-1 * (-1))v = 1v = v$
2. $ab = 0$, prove that a or $b = 0$
 - (a) $a=0/v = 0, v=0/a = 0$
3. empty set is not a vector space, it fails to satisfy only of the reqs. which one?
 - (a) no additive identity
 - i. "there exists an element 0 in v " no there doesn't.

homework: KBxSolvingSystems