

#flo #hw

## 1 | Finite-Dimensional Vector Spaces

title: Review

F denotes  $\mathbb{R}$  or  $\mathbb{C}$

$V$  denotes a [\[\[file:KBe20math530refVectorSpace.org\]\]](http://file.KBe20math530refVectorSpace.org) [\[KBe20math530refVectorSpace\]](http://KBe20math530refVectorSpace) over  $F$

- lin alg does not focus on arbitrary vector spaces
- it focuses on finite-dimensional vector spaces!

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title: learning objectives for the chapter
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- span
- linear independence
- bases
- dimension

- **notation:**
  - lists of vectors:
    - \*  $(2,1,4),(3,2,5)$ 
      - list len 2 of vectors in  $\mathbb{R}^3$
    - \* n-tuples without surrounding parens
- *linear combination*
  - a linear combination of  $x$  and  $y$  would be any expression of the form  $ax + by$ , where  $a$  and  $b$  are constants ~wiki
  - multiply each element in a list of vectors by an element in  $F$
  - and then add them up!
  - any relation between the element scalar and what's being multiplied? can the scalars repeat? #question
- *span*
  - the set of all linear combos of a list of vectors
    - \* denoted:  $\text{span}(v_1, \dots, v_m)$
  - span of empty list is  $\{0\}$
  - aka. linear span

the span of a list of vectors in  $V$  is the smallest [[subspace of  $V$  containing all the vectors in the list