#flo #hw #reading

---

1 | Bases !

- types of lists, so far
  - linearly independent lists
  - spanning lists
    - list of vecs, that when span()-ed, contains all the elements of the vector space.
    - ie. you can use linear combo of the original list to get to every element in the vector space

```
title: basis
a *basis* of V is a list of vectors in V that is [linearly independant](KBxLinearIndependence) and [spa
```

such as,

```
standard basis of $F^n$ is $(1,0, ... ,  0), (0,1, ... ,  0) , ... ,  (0, ... ,  0,1)$
$(1,2),(3,5)$ -> basis of $F^2$
```

- things can have many basis!

1.0.1 | criterion for basis

```
title: criterian for basis
a list $v_1, ... ,  v_n$ of vectors in V is a basis of V iff every $v \in V$ can be written uniqely in
$$ v = a_1 v_1  + ... + a_n v_n$$
where $a_1, ... ,  a_n \in F$
```

essentially, for a list of vectors in V to be a basis of V, every element in V has to be written uniqely as the linear combo of the org list of vectors. uh, #review

1.0.2 | spanning lists and basis

- spanning list isnt nesasarrily a basis cus they don't need to be linearly independent
  - but, each spanning list does contain a basis
- each spanning list can be converted to a basis through the removal of some number of elements
- but also, every linearly independent list extends to a basis
  - can be extended to a basis