#flo #hw

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1 | **Linear Maps**

```
no one get's excited about vector spaces -axler
```

the interesting part: linear maps!

```
title: learning objectives
- fundementals theorem of linear maps
- matrix of linear map w.r.t. given bases
- isomorphic vec spaces
- product spaces
- quotient spaces
- duals spaces
    - vector space
    - linear map
```

2 | **The vector space of linear maps**

key definition!

```
title: linear map
aka *linear transformation.*

a *linear map* from $V$ to $W$ is a function $T:V \to W$ with the following properties:
**additivity**
$T(u+v) = Tu+Tv$ for all $u, v \in V$;
**homogeneity**
$T(\lambda v) = \lambda(Tv)$ for all $\lambda \in F$ and $v \in V$.
```

the functional notation T(V) is the same as the notation Tv when talking about linear maps.

```
title: notation -- $L(V,W)$
the set of all linear maps from $V$ to $W$.
```

2.0.1 | **examples of linear maps**

- 0?
  - 0 is the func that takes each ele from some vec space to the additive iden of another vec space.
    - 0v = 0
    - left: func from V to W, right: additive iden in W
    - #question what does it mean for it to be a function from V to W?
- identity, denoted I
  - $Iv = v$
  - maps each element to itself linear transformation like a `.map`?