SUBSPACES
the idea

Vectors:

- Coordinates of points
  eg (1,3) → ↑

- Pieces of info about a situation
  eg (5,2,30,13)

- Journey
  (5,13) → (6,18)

- Thing that can do linear combinations
  a (thing) + b (other thing)

VECTOR SPACE
Maths operation idea

Vector space \( \mathbb{R}^n \)

Subspace

Small part that is self-contained when you do linear combo's.

\[ u, v, w \in W \]

need \( u + bv \in W \)

or need \( au + cv \in W \)

need \( u + vw \in W \)

Also need a vector at all

Why not \( 0 \in W \) ?

Self contained \( \Rightarrow \)

0. \( 0 \in W \)

1. \( uv + uv \in W \)

2. \( uv + uv \in W \)
Geometry Idea

\[ \mathbf{u} + \mathbf{v} \]

Being somewhere: U point
Adding: U arrow

Scalar mult
ADDITION

POINT, LINES, PLANES, 3D SPACES,

EQUATIONS IDEA

E vectors | equations \Rightarrow

Linear
Homogeneous
\Rightarrow Subspace.
SPAN IDEA

span \& vectors \in \mathbb{R}^n

\Rightarrow \text{subspace}

More rewrite as span