#flo #disorganized #incomplete

1 | Administrative bits

- Will present problems from 2.B and/or 2.C next week
- Mini quiz, stop yourself after an hour
- and give your subconscious a chance to think about things
- **No need to say ”clearly”, ”obviously”, ”evidently”**

2 | #icr Axler2.C

#source Axler Linear Algebra Done Right 2.C ## Polynomials are vectors - because you can add and scale them and they are kind of nice in general

2.1 | The box under 2.38

- You can't understand a vector space just by knowing the vectors inside
  - you also need to know the field that you are in
  - See 2.A ex5
- The field that you are over changes your dimension: usually we think of $\mathbb{C}$ as a vector space over $\mathbb{R}$, but in this class we think of it as over $\mathbb{C}$, which means dim $\mathbb{C} = 1$

2.2 | Axler2.41

- It's my question! See KBe20math530floQuestions

2.3 | Axler2.42

- #tip If it's a spanning list that's the right length, then it's a basis and therefore linearly independent.
- If it's a linearly independent list and it's the right length, then it's a basis and therefore spanning.

2.4 | Axler2.43 Dimension of a Sum

2.4.1 | An Example

- If you have two planes in 3 space, and they intersect at exactly one line, then you can't just add the dimension of the two planes (2+2 = 4 which is more than 3 space can allow).
  - If the planes are parallel, and both subspaces, then we know they both go through the origin and thus are the same plane.

2.4.2 | Some tips

- Usually easiest to get a basis of a subspace by building on instead of taking out
  - for example if you have a slanty plane in 3 space, and you start with standard basis, then you won't even get the slanty plane.

2.4.3 | The span is $U_1 + U_2$

- Because it's a double containment
  - $span \subset U_1 + U_2$
  - $v \in span \implies v = a_1u_1 + \ldots + a_mb_m + b_1v_1 + \ldots$
  - For all $u.$ in the span, you can write it as something in U_1
    * something in U_2
