#ret #hw

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1 | 2.A Exercises

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Please reconsider the questions from Friday now that we have discussed them and part of Chapter 2.A. Do

Be sure to try a few problems, so you have some ideas to share with your classmates on Thursday! Ideall

And if you haven't brought in your old quizzes, please be sure to do so!
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1.0.1 | Linear Dependence Lemma

KBxLinearDependenceLemma

1.0.2 | A few problems

~Fibonacci! ##### excr. 3 Find a number t such that $(3, 1, 4), (2, -3, 5), (5, 9, t)$ is not linearly independent in R^3 ***** Set up system of equations, $3a + 2b = 5$ $a - 3b = 9$ $4a + 5b = t$

solve, get $b = -2$ and $a = 3$ plug it back in, $4(3) + 5(-2) = 2 = t$

answer: $t = 2$ *ah, 2.2 != 2.20 – nice.*

1. Exercise 5 *from my personal notes:*

   (a) show that if we think of C as a vector space over **R**, then the list (1+i, 1-i) is linearly **independent.**
   (b) show that if we think of C as a vector space over **C**, then the list (1+i, 1-i) is linearly **dependent.**

   Means: use scalars from R in the vector space C? *****

   (a) $a(1 + i) + b(1 - i) = 0$

   prove that the only values of a and b are 0, thus satisfying the linear independence definition.

   move i to only one side, $a + b = i(b - a)$ since $a + b$ comes from R, and R is closed under addition, $a + b$ cannot have a complex component. $\therefore$ a and b must $= 0$

   (a) $a(1 + i) = b(1 - i)$

   let $b = i$ let $a = 1$

   $i(1 - i) = i - i^2 = 1 + i$ $\therefore$ we can represent $(1 - i)$ in terms of $(i + 1)$ with scalars from C, and thus, it is linearly dependent.

2. Exercise 8 My personal notes on one of the exercises I solved:

   Prove or give a counterexample: If $v_1, v_2, ..., v_m$ is a linearly independent list of vectors in V and $\lambda \in F$ with $\lambda ! = 0$, then $\lambda v_1, \lambda v_2, ..., \lambda v_m$ is linearly independent. *****

   $a_1v_1 + a_2v_2 + ... + a_mv_m = 0$ only if all scalars are equal to 0, as given in the definition

   $\lambda(a_1v_1 + a_2v_2 + ... + a_mv_m) = 0$ $\lambda \cdot 0 = 0$ $\lambda a_1v_1 + \lambda a_2v_2 + ... + \lambda a_mv_m = 0$ only if all scalars are equal to 0 $\therefore$ $\lambda v_1, \lambda v_2, ..., \lambda v_m$ is linearly independent.

Draws from: KBxLinearIndependence KBxSpansLinAlg

In class review #extract

2 | In class after

2.0.1 | KBxDirectSum

[file:KBxDirectSum.org]

#question how do finite fields work? field is just 0 and 1? but what about being closed under addition?

Trivial: the simplest one? how do you quantify that? #question Just about zeros?

Interesting concept: Step 1, to Step J. Represent algo's as an example first, then the final iteration? Instead of just one generalized loop.