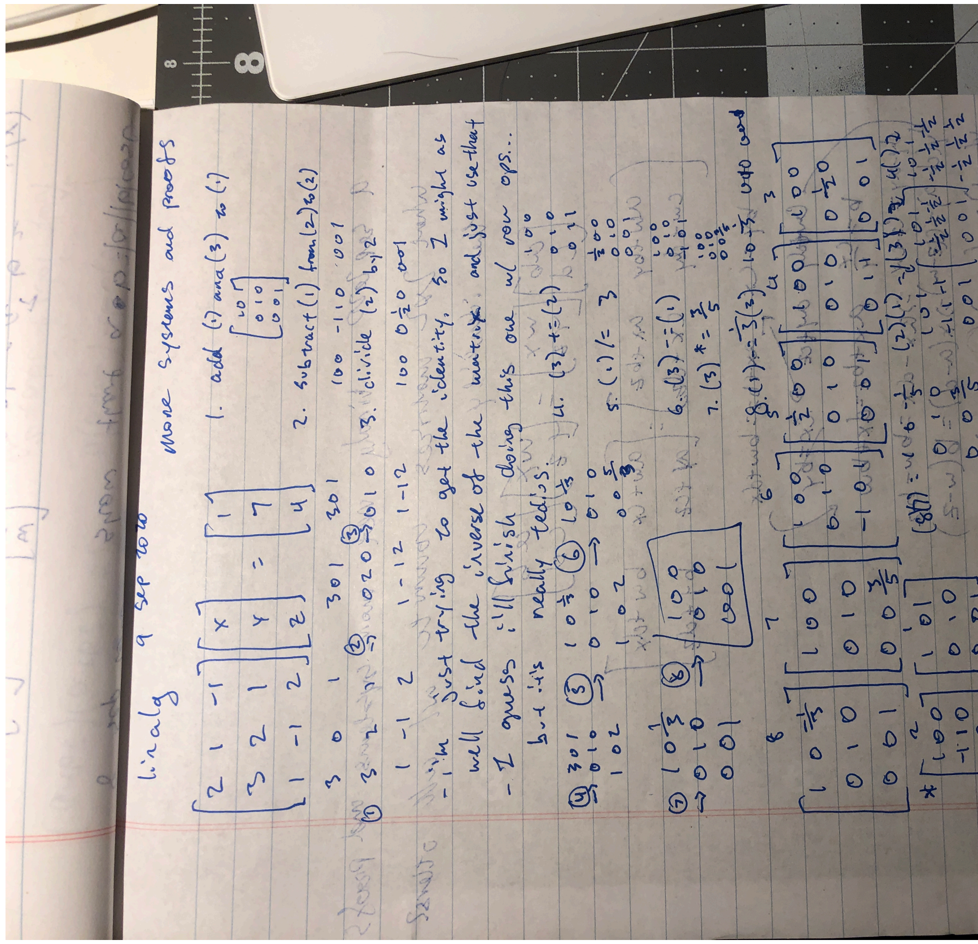
**Source:** [KBe2020math530refExr0nRetIndex]

## Solve Equations



Operation timed out. Arithmetic errors.

## Read 1.B and 1.C

### General Notes

- The distributive property is extremely useful ### 1.35 Example
- a) If $b = 0$ then we can divide all $x_3$ by $5$ and combine the last two terms to get $F^3$, which is a vector space, without loss of generality. If not, then when you try to multiply by a scalar then you will find that the above reasoning breaks (i think).
- b) $f(x) = 0$ is continuous, so the additive identity exists. All sums of continuous functions result in continuous functions, so it is closed under addition. And all scalar multiples also work out.
- c) slightly awkward: i don't actually know what a differentiable real valued function is. #todo-exr0n
- d) (see above)
- e) what does it mean for a sequence of complex numbers to have a limit $0$? but I think you can use the same argument that the missing elements are just "collapsed" into one invisible one. ### 1.40 Definition direct sum

- Something about uniqueness?
- If there is only one way to write zero then it works (1.44 Condition for a direct sum)

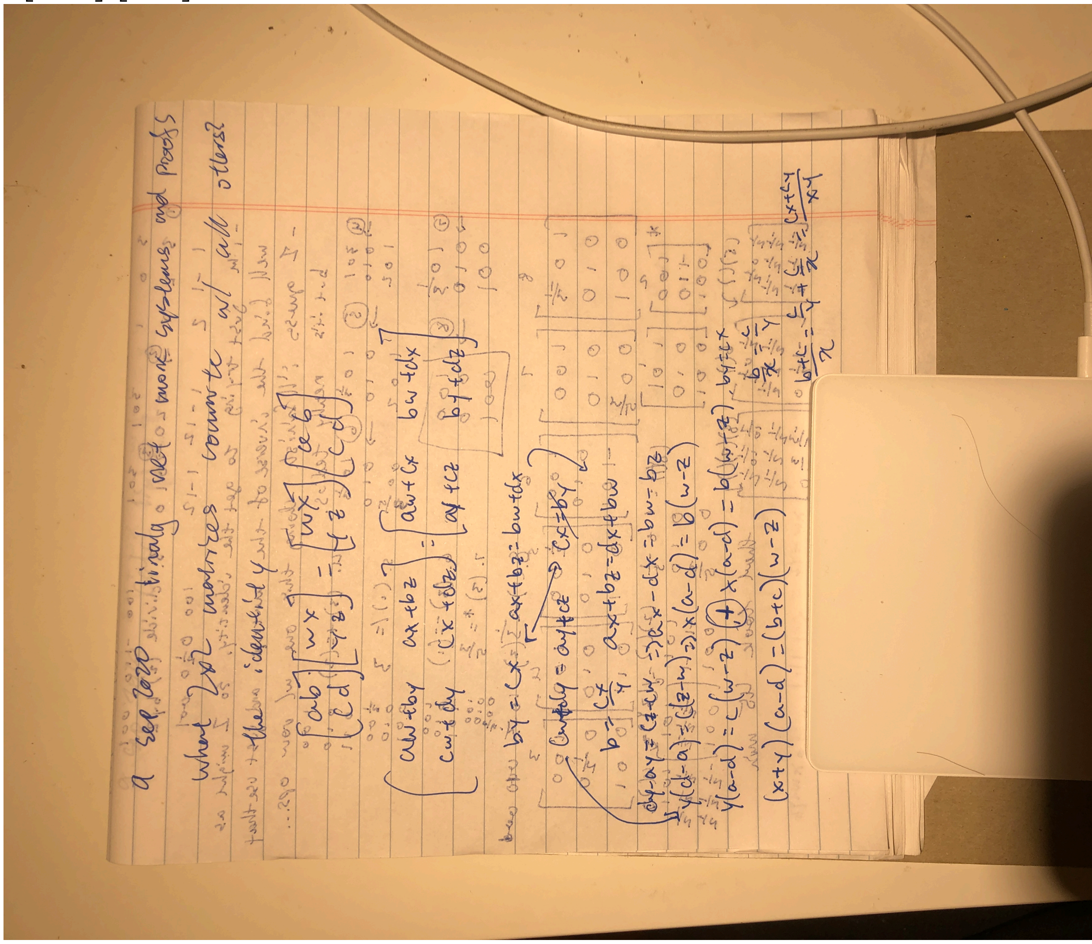
**Exercise to present**

I would be interested in 7, 8, 10, 12, 14-19

## 2x2 Matrices that are Commutative

(under multiplication, with all other 2x2 matrices)

Starting with $\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} w & x \\ y & z \end{bmatrix} = \begin{bmatrix} w & x \\ y & z \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, I got $(x+y)(a-d) = (b+c)(w-z)$ and $by = cx$, but wasn't



sure how to further develop it.

## Epilogue

Linear algebra homework always takes so long. Even though I skip like half of the problems. This is kind of an issue.