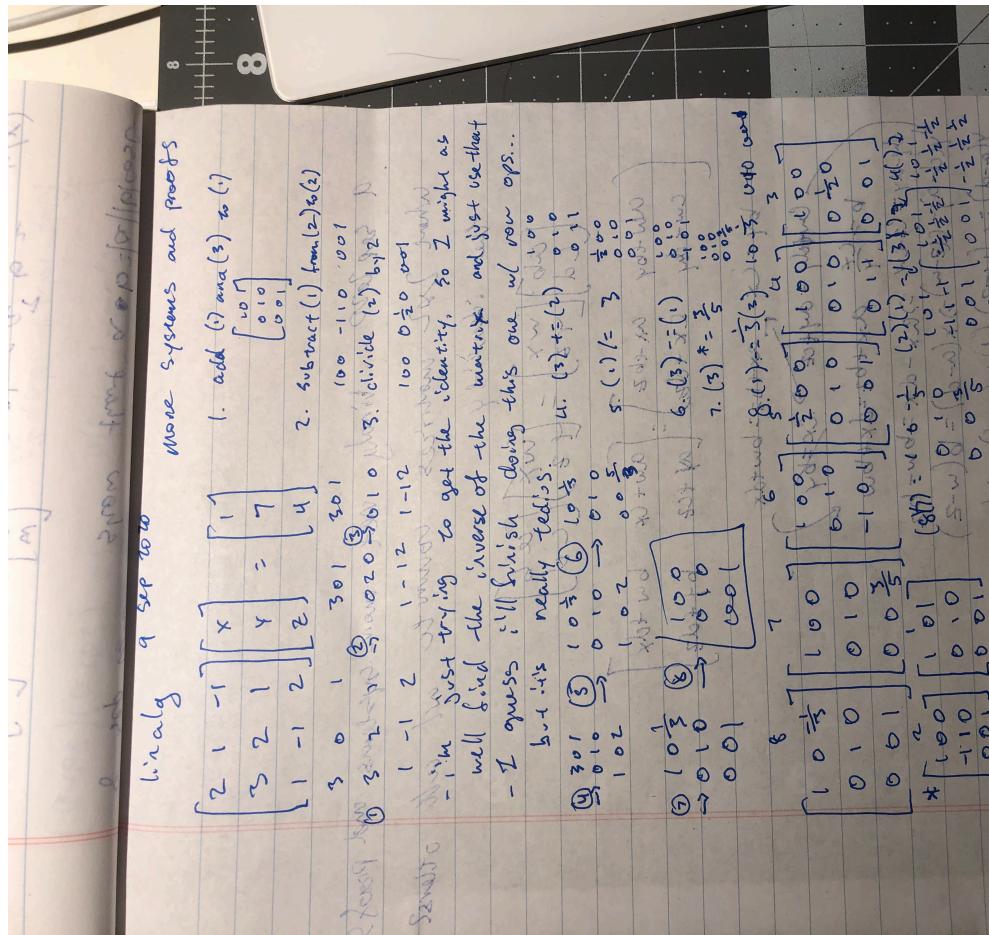


**Source:** [[KBe2020math530refExr0nRetIndex]]

# 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)

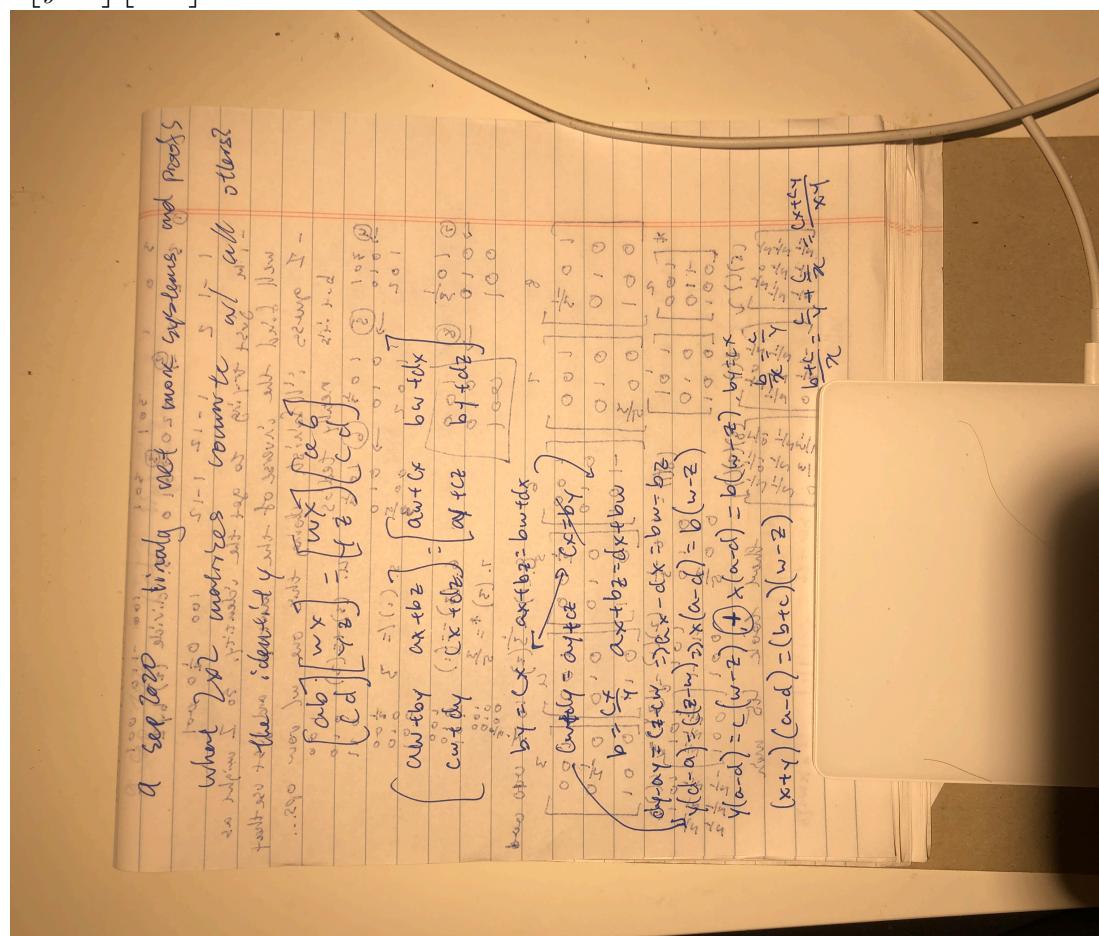
## **Exercise to present**

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

## 2x2 Matrices that are Commutative

(under multiplication, with all other  $2 \times 2$  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.