

Math 511

Exam 1

If you haven't uploaded your "self grading"...

➤ Easiest for me (and in all future exams)

➔ Due date: upload exam

➔ On "Next Monday": Exam solutions

~ grade your work (write comments)

① obvious: Correct = (-0) or all 10 pts (PP # agree)

② partial credit (I assign) = (???) P

I'll remove less if you find why you are wrong and fix it.

$$\left[\begin{array}{cccc|c} 1 & -1 & 0 & 0 & 5 \\ 0 & 1 & -1 & 0 & 2 \\ 0 & 0 & 1 & -1 & 3 \\ 0 & 0 & 0 & 1 & 1 \end{array} \right] \rightarrow$$

$$P_4 + P_1 = N_1$$

$$\left[\begin{array}{cccc|c} 1 & -1 & 0 & 0 & 5 \\ 0 & 1 & -1 & 0 & 2 \\ 0 & 0 & 1 & -1 & 3 \\ 0 & 0 & 0 & 1 & 6 \end{array} \right] \rightarrow$$

Wrong

Should have been -1

105

$$\left[\begin{array}{cccc|c} 1 & -1 & 0 & 0 & 5 \\ 0 & 1 & -1 & 0 & 2 \\ 0 & 0 & 1 & -1 & 3 \\ 0 & -1 & 0 & 1 & 6 \end{array} \right] \rightarrow$$

~~$P_2 + P_4 = N_3$~~

$P_2 + P_4 = N_4$ Should have done

$$\left[\begin{array}{cccc|c} 1 & -1 & 0 & 0 & 5 \\ 0 & 0 & -1 & -1 & 2 \\ 0 & 0 & 1 & -1 & 3 \\ 0 & -1 & 0 & 1 & 6 \end{array} \right]$$

3.1 #13

objects: real numbers \mathbb{R}
 ops: \otimes $\otimes X$ ("normal multiply")

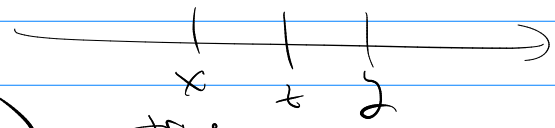
$\otimes X \oplus Y = \text{Max}(X, Y)$ $3 \oplus 7 = \text{Max}(3, 7) = 7$

$-20 \oplus 10 = \text{Max}(-20, 10) = 10$

Actions? closure

- a) $\otimes X$ is this a real number? yes
- b) $X \oplus Y = \text{Max}(X, Y)$ is this $\in \mathbb{R}$? yes

\otimes for $(X, Y) \in \otimes X$

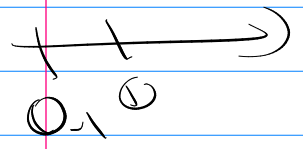


- A) $\text{Max}(X, Y) = \text{Max}(Y, X)$ true
- B) $\text{Max}(\text{Max}(X, Y), Z) = \text{Max}(X, \text{Max}(Y, Z))$ true
- C) is there a 0 ? (Additive Identity)

$\text{Max}(X, \underbrace{0}_{?}) = X$

Assume 0 exists

$\text{Max}(0-1, 0) \stackrel{\text{must happen}}{=} 0-1$
 \uparrow
 $\stackrel{=}{=} 0$
 \uparrow
 0

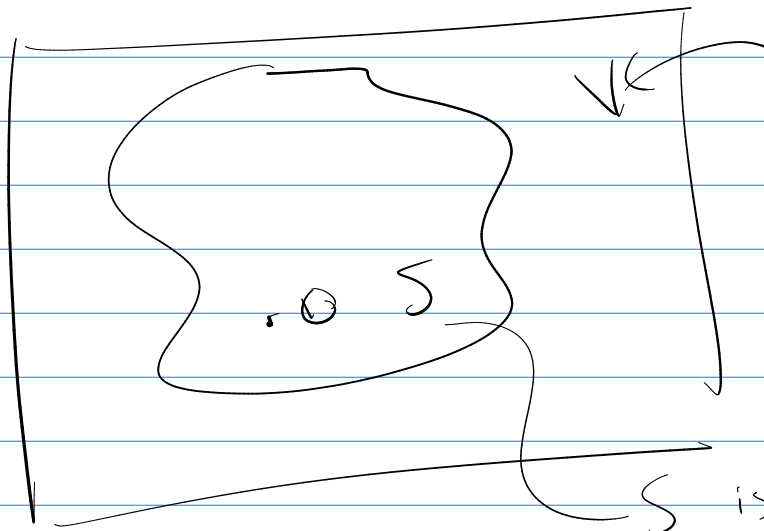


A3) fails

but I get this!

So $\otimes X$ is a vector space

Subspace (Concept)

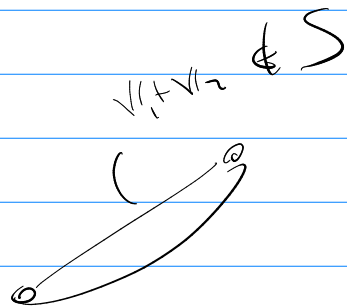
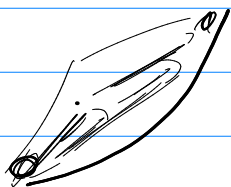
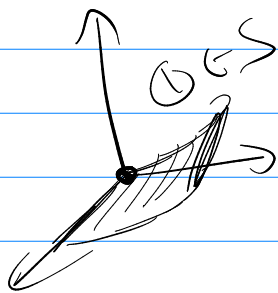
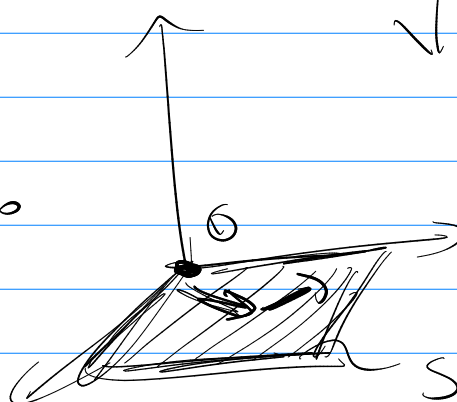


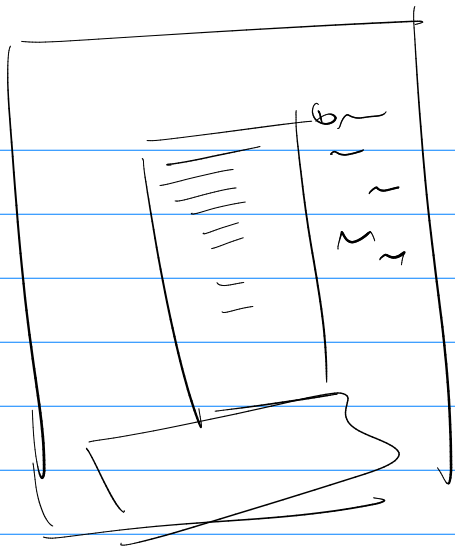
objects plus
 $\underline{2v}, \underline{v_1+v_2}$
 all to actions into
Vector Space!

S is a subset of V
subspace?

check: ① $0 \in S$

② if $v \in S$ is $\underline{2v} \in S$?
 ③ if $v_1, v_2 \in S$ is $\underline{v_1 + v_2} \in S$?
 $V = \mathbb{R}^3$



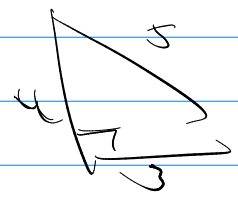


$$x^2 + y^2 = z^2$$

$$x^1 + y^1 = z^1$$

$$3^2 + 4^2 = 5^2$$

$$3 + 4 = 7$$



$$x^n + y^n = z^n$$

$$n \geq 3$$