Weekly Assignment 1

Carl Friedrich Gauss
MATH 117: Advanced Linear Algebra

July 31, 2023

Some hints for this assignment are written in the footnotes. See the weekly assignment webpage for due dates, templates, and assignment description.

1. Let F be a field. For $u, v \in F$ and $\alpha \in F$, define vector addition by $u \oplus v := u + v - 1$ and scalar multiplication by $\alpha \odot u := \alpha u - \alpha + 1$. Prove that $(F, \oplus, \odot)$ is an F-vector space.[1]

Proof. Write your proof here.

□

I will add more problems after the lecture on Wednesday.

[1] You need to specify a zero vector 0 and the additive inverse $\ominus u$ of $u \in F$, and then verify the several defining conditions of a vector space.