

Math 231 — Hw 2

Sara Jamshidi, Jan 16, 2025

1. Today we looked at an example of a finite field, a field with finitely many objects: \mathbb{Z}_p . Such structures are always fields when p is a prime number. For \mathbb{Z}_5 , find all the additive and multiplicative inverse of the elements in the field: $\{0, 1, 2, 3, 4\}$. (Note that 0 will have no multiplicative inverse.)
2. For finite fields, p must be a prime number. To illustrate why \mathbb{Z}_4 is not a field, construct its multiplication table.

Recall that a multiplication table is a table where the header row and first column list the elements of the set, and each cell contains the product of the corresponding row and column elements.