

## Exercises

3.168 [128]  $\mathbb{Z}$  are the relative integers with the usual operations. Let  $p \geq 1$  a fixed integer. Consider the equivalence relation

$$n \sim m \iff p|(n - m)$$

that is, they are equivalent when  $n - m$  is divisible by  $p$ .

Show that there are  $p$  equivalence classes  $[0], [1], \dots, [p - 1]$ . We indicate the quotient space with  $\mathbb{Z}/(p\mathbb{Z})$  or more briefly  $\mathbb{Z}_p$ .

Show that the usual operations of sum, subtraction, product in  $\mathbb{Z}$  pass to the quotient.