CS 235: Algebraic Algorithms, Spring 2021

Discussion 5 Date: Tuesday, March 23, 2021.

Problem 1. Abelian Groups

- (a) Write down the Abelian operation tables for \mathbb{Z}_5 .
- (b) Find the order of the following finite groups: \mathbb{Z}_{600} , \mathbb{Z}_{600}^* , and $\mathbb{Z}_{600}\{10\}$.

Problem 2. Let H_1 be a subgroup of an abelian group G_1 and H_2 be a subgroup of an abelian G_2 . Show that $H_1 \times H_2$ is a subgroup of $G_1 \times G_2$.

Problem 3. Let $S = \mathbb{Z} \setminus \{-1\}$ and define a binary operation on S by $a \star b = a + b + ab$. Show that S is closed under the \star -operation and S forms an abelian group under \star .