



NUMBER THEORY
FALL 2020

ASSIGNMENT 6.1
DUE OCTOBER 7

Exercise 1. Prove that

$$n = 1678781422134741054423047947441055656115600301094736801 \\ 2425874667806297636227200527649707818860476378869522487$$

is composite. [*Remark.* This is a coding problem. Please submit a well-documented copy of your code. Feel free to use the programming language of your choice.]

Exercise 2. Textbook exercise 5.2.16.

Exercise 3. Let G be an abelian group. Prove that for any $n \in \mathbb{N}$,

$$G(n) = \{a \in G \mid a^n = e\}$$

is closed under multiplication and inversion in G . Where do you need the fact that G is abelian?

Exercise 4. Determine the 2-torsion subgroup of $\mathbb{Z}/n\mathbb{Z}$.

Exercise 5. Textbook exercise 5.3.10.