NUMBER THEORY I
SPRING 2018

ASSIGNMENT 9.1
DUE MARCH 21

Exercise 1. Let G be a group and suppose $g \in G$. Prove that if g has infinite order, then $g^i \neq g^j$ for all $i \neq j$. [*Suggestion:* Prove the contrapositive.]

Exercise 2. Suppose $(\mathbb{Z}/n\mathbb{Z})^\times$ is cyclic. How many generators does it have?

Exercise 3. Show that $(\mathbb{Z}/50\mathbb{Z})^\times$ is cyclic and find all of its generators. Express them in the form $a + 50\mathbb{Z}$ where $1 \leq a < 50$.