Modern Algebra
Spring 2023

Assignment 5.1
Due February 15

Exercise 1. Let $(A, +)$ be an abelian group and let $n \in \mathbb{Z}$. Define $f : A \to A$ by $f(a) = na$. Prove that f is an endomorphism. Where does your argument require the hypothesis that A is abelian?

Exercise 2. Lang, Exercise II.3.3.

Exercise 3. Lang, Exercise II.3.4.

Exercise 4. Let $f : G \to H$ be a homomorphism of groups and let $x \in G$. How are $|x|$ and $|f(x)|$ related? Here $|\cdot|$ denotes the order of an element (in the appropriate group).