Name: _____

Read the first part of Section 4.1, up to and including the proof of Theorem 4.9.

Reading Questions

1. Make sure you know the definitions of cyclic group, generator of a cyclic group, and the order of an element in a group.

2. Reread Example 4.5. Consider the group $\mathbb{Z}_4$. Is $\mathbb{Z}_4$ a cyclic group? If so, what elements of $\mathbb{Z}_4$ are generators? Find the order of each element in $\mathbb{Z}_4$.

   (Note: Since $\mathbb{Z}_4$ is an additive group, the order of an element a in $\mathbb{Z}_4$ is the smallest positive integer n such that $a + \cdots + a$ (n times) is equal to zero, i.e. $na = 0$.)

3. Reread Example 4.6. Consider the group $U(5)$. Is $U(5)$ a cyclic group? If so, what elements are generators? Find the order of each element in $U(5)$.

4. True or False. (Give citations or counter-examples.)

   (a) Every finite group is cyclic.

   (b) Every cyclic group is finite.

   (c) Every cyclic group is abelian.

   (d) A group G is cyclic iff there is a unique element a in G such that $G = \langle a \rangle$.

5. What struck you in this reading? What is still unclear? What remaining questions do you have?