Major Definitions: Group, subgroup, order, cyclic group, abelian group, homomorphism, epimorphism, monomorphism, endomorphism, isomorphism, automorphism, coset, index, normal subgroup, factor group, direct product.

Major Theorems: Lagrange’s Theorem, Theorem 5.5

Exercises:
1. Show that the center of a group is a normal subgroup.
2. Show that if $f: G \to G'$ is a homomorphism of groups and $N' \triangleleft G'$, then $f^{-1}(N') \triangleleft G$. If $N \triangleleft G$, then $f(N)$ isn’t necessarily a normal subgroup of $G'$.
3. Let $H, K$ be subgroups of a group $G$. Show that $HK$ is the subgroup generated by $H$ and $K$ if either $H$ or $K$ is normal. Show $HK$ may not even be a subgroup if neither $H$ nor $K$ is normal.
4. Give an example of a group $G$ and two elements $a, b \in G$ of finite order where $ab$ has infinite order.
5-10. Do page 33 #2, page 34 #9, page 40 #8, page 45 #1, page 46 #19 and 20.
Numbers 2, 3, 6 and 9 are to be presented in class.