- We covered Chaper 1, Chaper 2 (sections 1, 2, 3, and 5 (to an extent)), Chapter 3 (sections 1, 2, and 3), Chapter 4 (sections 1 and 2), and Chapter 4 (sections 1, 2, and bits of 4). You learned a lot this semester!
- Know the definitions of group, subgroup, homomorphism, kernel, group action, orbit, stabilizer, order of an element, order of a subgroup, cyclic group, normal subgroup, coset, quotient group. This list is not exhaustive, but should convey the spirit of things.
- Know the basic examples of groups and their properties. $\mathbb{Z}$, $\mathbb{Z}/n\mathbb{Z}$, D_n, S_n, Q_8 etc.
- Know how to work with the elements of the groups above (multiplying elements of S_n in cycle notation, multiplying elements of D_n in $s^a r^b$ notation, etc.)
- Know the big name theorems, Lagrange, Cayley, The Isomorphism Theorems.
- Know how to write all abelian groups of order n in terms of their elementary divisors.
- Some example problems:
  - For each subgroup of $\mathbb{Z}/24\mathbb{Z}$ give a generator, and draw the lattice of containments between subgroups.
  - List up to isomorphism the abelian groups of order 200, in terms of their elementary divisors.
  - (harder) Let G act on a set A, and fix some $a_0 \in A$. Recall that $a \sim b$ if there is $g \in G$ such that $g \cdot a = b$ is an equivalence relation on A (we proved this in class). Let A_0 be the equivalence class of a_0 under $\sim$. Prove that $|A_0| = [G : Stab_G(a_0)]$ (find a 1-1 correspondence between elements of A_0 and cosets of $Stab_G(a_0)$).