Math 417: Exam 2 handout

Date, time, and location: Wednesday, March 14, 2018, 1:00–1:50pm, 447 Altgeld Hall.

Office hours: Tuesday, February 13, 3:00–5:00pm, 341B Illini Hall.

Test format: Similar to the first exam. In comparison to the first exam, there may be fewer problems, but those problems may be more involved.

Material covered: Up to and including lecture 21, and the corresponding material in the textbook. This exam will be focused on material not covered on the last exam, meaning lectures 10–21.

The specific things you may be tested on include:

1. The classification of cyclic groups and their subgroups. Subgroup generated by a set or a single element. Orders of elements.
2. Calculations in dihedral groups (the group of symmetries of a regular polygon).
3. Homomorphisms, kernels, normal subgroups.
4. Left and right cosets of a subgroup. Lagrange's theorem and its corollaries.
5. The construction of the quotient of a group by a normal subgroup. The main quotient group isomorphism theorem: If $\phi : G \to \overline{G}$ is a surjective homomorphism with kernel $N$, then $G/N \cong \overline{G}$. The other theorems about quotient groups presented in lecture 19.
6. Direct products of groups.
7. You should also be familiar with the examples discussed in the lectures, such as $S_n$, $\mathbb{Z}_n$, $\mathbb{C}^*$, $\text{GL}(n, \mathbb{R})$, and how they relate to the concepts above.