

ABSTRACT ALGEBRA
DR. GRAHAM-SQUIRE

TEST 1 REVIEW

- The test will take the entire period and will have about 6-10 problems.
- Important things to know: Big ideas such as what is a group, subgroups, cyclic groups, permutation groups, and major theorems related to them (for example the Fundamental Theorem of Cyclic Groups). You do not have to memorize many things, but you should know major definitions and how to use them (for example, knowing that to prove something is a subgroup, you can use the two-step test, and what that entails). You should also understand the proofs of theorems we have seen, and be able to reproduce the shorter proofs (if I give you a longer proof on the test, it would just be one small part of the proof, not the entire thing). You should also be able to explain what a particular theorem *means*, that is to give an example that illustrates what the theorem is saying.
- You should also know some good examples: Such as an example of a cyclic group, a non-Abelian group, a proper subgroup of a group, a non-cyclic group, a finite group and an infinite group, as well as some things that fail to be a group (and why they fail). That list is not exhaustive, but is just something to get you started.
- Here are a few good exercises from the book to work on. You don't have to do all of them, but they are all good questions to think about:
 - Chapter 5: #8, 17, 23, 38, 81-83
 - Suppl. Exercises for Chapters 1-4 (pages 95-98): #1-3, 5, 11, 14, 15, 20, 35, 38, 47, 49
- Things I don't care about: Memorization of notation of groups—I will try to make everything clear on the test, and I won't use a notation such as $C(g)$ or $U(30)$ without telling you that it means (respectively) the "Centralizer of g " or "the group of integers less than 30 that are relatively prime to 30". With that said, it is probably helpful to be familiar with those notations (as you probably are already—I just don't want you wasting time trying to memorize them), and there are some notations that we have used often enough that I will assume you know, such as $\langle g \rangle$ and $|g|$, meaning the cyclic group generated by g and the order of g , respectively.
- In general, I tell students that the best way to study for one of my tests is to attempt new problems. Since you will be seeing new problems on the test, attempting new problems is the best way to practice for that. Note that you DO get partial credit, so even if (for example) you do not complete a proof on the test, you will still get partial credit for taking a correct proof method and explaining what you are doing clearly. On the flip side, if you have a correct answer but I cannot follow your argument, you will lose points. I do not expect proofs on a quiz/test to be as formally accurate as I would expect on a homework assignment, but I do expect them to make sense and have a generally correct structure.