Math 404 portfolio
Spring 2005

During the quarter, I will assign several *portfolio problems*; I anticipate four such assignments. Your goal is to have, by the end of the quarter, nicely written solutions to these problems. To accomplish this,

- You will peer-review the first draft of each problem.

- You will turn in a second draft of each problem, and the TA will read and comment on it.

- At the end of the quarter, you will turn in a third draft, and I will grade it.

    - Your third draft will be done as a group project: after working on the first two drafts individually, you will collaborate with other students to produce the third draft. You should work in groups of three or four; I reserve the right to give less than full credit for papers done in smaller or larger groups.
    - You must turn in your earlier drafts with the third draft.
    - You should write a cover sheet for each problem, describing your progress from the earlier drafts to the third one, and how the collaboration went. If you're in a group that doesn't have three or four people in it, then your cover sheet should also explain this.
    - Different problems can be done in different groups: just make sure that the appropriate names are on the appropriate solutions when you turn then in.

Turning in the first and second drafts on time, and participating in the peer-review processes, will determine 10% of your grade for the class; the quality (both in mathematics and writing) of your portfolio will determine another 10%.

In the best of all possible worlds, your solutions would be typed up on a computer rather than by hand, but I'm not requiring this. If you want to do it on a computer, a program called LaTeX is the best thing around for doing mathematics.

The final drafts of your portfolio problems are due on **Friday, May 27**.

[The following is unchanged from Winter quarter.]

Grading criteria.   I will award points from 1 to 5 for two criteria: mathematical correctness, and quality of writing. Your grade on the portfolio will correspond to your total score.

1. Mathematical correctness.   Is your solution essentially correct? Does it have any mistakes; if so, how many, and how crucial are they? Have you proved everything that was asked? Did you in fact prove a generalization of what was asked? Are there any serious logical flaws? Have you "proved" something false? Did you use relevant techniques? Did you use all of the hypotheses?

Here is what the numbers represent, roughly, for this category:

1. Most of your proofs contain serious logical flaws, and so are wrong, or purport to prove something false.

2. Many of your proofs contain serious logical flaws, or do not prove everything that was asked.

3. There are a number of small-to-medium mistakes, or a just a few major ones, or some mix of these. Your logic is occasionally shaky, but more or less correct. You have used material or techniques from the appropriate section of the book. You have used all of the hypotheses, or explained why you didn't.

4. There are no major flaws, but there are some (easily correctable) mistakes.

5. There are only a few easily correctable mistakes. You may even have proved a more general result.

2. Quality of writing. There are "local" and "global" writing issues. Local ones: Have you chosen good notation? Are you using (mathematical) language well and appropriately? Is everything you're written relevant? Have you included a good level of detail? Do you have good transitions? Are there grammatical errors or misspellings? Does your solution sound good when read aloud?

Global writing issues: Have you broken the proof into ideas and paragraphs well? Have you recognized and separated out lemmas and intermediate results? Did you make an appropriate choice of method of proof?

Here is what the numbers represent for this category:

1. You have only provided pseudo-random strings of symbols on the page. It's not clear what's being proved in which part of your solutions.

2. You have some garbled mathematical language (for example, you refer to the group of integers as a homomorphism). There is some extraneous material. You prove the same thing several times.

3. Most of the time, you have chosen an appropriate method of proof, and have good notation. You have enough detail. You have mathematically sensible sentences. You have targeted the right audience: your classmates. For the most part, you use good grammar and don't misspell things.

4. Your solutions are well-organized. There is no extraneous stuff. You don't have too much detail. You have good transitions. Your solutions sound good when read aloud. There are very few grammatical errors or misspellings.

5. There are almost no errors. You have recognized lemmas where appropriate. Your best solutions are elegant and to the point: terse, but not overly so; they are good enough to be publishable in a solutions manual for this course.