

Math 109, Winter 2005

Instructions for Writing Assignment

GOAL: The purpose of this writing assignment is to demonstrate your understanding of group theory by showing that you can express these difficult concepts in plain English. The point is that you can't really accomplish this without fully understanding the mathematics first. In general, explaining your ideas in words in your mathematical and scientific work should force you to clarify your thinking about what you know and what you don't know.

EXPECTATION: The ultimate goal of the course is to develop skills to attack mathematical questions on your own using the logical reasoning techniques we've been practicing. Papers should possess two main components. First, they should demonstrate an understanding of the mathematical material in a well-organized and precise summary. In this portion, the best papers will attempt to re-package this information in a new way, not simply listing properties or following Armstrong's description. Second, they should address our main goal of the course, showing some evidence of mathematical analysis beyond a simple summary. This often takes the form of an exploration of questions using the tools from the course.

GUIDELINES: As a first attempt, you should describe the groups of symmetry of each of the five Platonic solids. Read chapter 8 in Armstrong which discusses these concepts and then formulate your own plan for determining the group of symmetries. Maybe you will find it most natural to simply treat each example equally, or do one example in careful detail and then argue why your work implies results for the other solids. This decision of how to present the material is up to you, but it should feel complete in this respect.

Second you should try to understand and discuss the meaning of dual solids, as discussed in Chapter 8. This can be done for the first draft or else postponed until the second. Finally, in the third draft you should have some attempt to take these ideas beyond the scope of the text. Ask interesting questions that come up in the course of thinking about these groups and then make an attempt to answer them. Again, if you get really into this, then you can do some of these things earlier rather than later in an attempt to make this a centerpiece of your course-long efforts. As always, you can ask me or Robin if you have any questions and schedule time with either of us to discuss the drafts.

FORMATTING, ETC.: While there is no length requirement, it seems to me that a good paper would take 4 or 5 pages to explain. For the final drafts, typed papers are greatly preferred. They should be self-contained rather than referring to diagrams which are not included. Also remember that I am placing weight on your better performances in the class, so this is a chance to do something good to give me something to think about when preparing grades, especially if you haven't performed as well as you would like on the midterm. No grade will be given on these until the final draft is turned in. However drafts must be turned in at all stages as part of the revision process.