

## Worksheet Write-ups

As we complete each of the Math 490 worksheets, Jenny will make a selection of problems to be formally written up, and select a group to be responsible for each problem.

Copies of your solutions will be distributed to the class. These solutions are **not** graded, and **you** are responsible for the correctness and completeness of your solution. If you have specific questions or concerns about your solution, you are welcome to bring them to office hours.

Our class's standards for respect, professionalism, and collegiality extend to this group work.

Completion of these solutions conscientiously and on time, and good conduct within your group, will be considered as a component of your 'participation' grade.

### Student roles

Once a group is chosen to write up a solution, three students are assigned the following roles.

- **The scribe** – the main role. You are responsible for writing up the initial draft, and each subsequent corrected draft, of the groups' solutions.
- **The skeptic**. You responsible for corroborating the mathematical correctness of the solution. Does the structure of the proof make sense? Are there mistakes or gaps? Are all the steps present and complete? Is the proof presented in a logical order? Is each statement mathematically precise? Is the mathematical terminology used correctly? Is notation, indexing, etc, properly executed?
- **The copy-editor**. You are responsible for editing for language and readability. Is the proof written in complete, orderly English sentences? Is the presentation clear – is it easy to follow the reasoning at each step? Is it clear at each point what is being assumed, and what is being deduced? Is the spelling, grammar, and general English usage correct? Is all notation defined and used consistently? Are pictures appropriately labelled and referenced?

### What to hand in

On the solution you hand in, you should include:

- the worksheet and problem number you are solving;
- the name of the scribe, skeptic, and copy-editor;
- the final copy of your solution.

### Due dates

Your group has at most about two weeks to complete the write-up. You are responsible for creating a timeline within the group, and coordinating amongst yourselves. Generally speaking, the scribe should provide a draft of the solution to the skeptic and copy-editor within about 4 days, and should receive the first round of feedback within 4 days. Over the next 4-5 days there should be

as many rounds of revision as necessary to bring the solution to a state that is satisfactory to all three group members.

Since, in principle, your group has already crafted a complete and rigorous solution to every problem in class, our hope is that these write-ups will typically take much less than this allotted timeframe to complete.

### Tips

- Your solutions are expected to be both mathematically correct and clearly communicated. Remember that your classmates are your target audience, and your goal is to make the solution understandable to them.
- You are encouraged, but not required, to typeset your solutions, using the typesetting software for your choice. This will make minor revisions easy to implement. If you do choose to hand-write your solution, you should be prepared to re-write it through several drafts. Hand-writing must be legible.
- Pictures and other visual aids are powerful communication tools and are strongly encouraged. You are welcome to submit a solution that is a combination of typeset paragraphs and hand-drawn and -annotated pictures. You may draw your pictures on a separate sheet of paper, number them, and reference them in the write-up, so you can edit the write-up without needing to re-draw the pictures.
- At the same time, be wary of using pictures as a step of the argument – in many cases, a picture will have implicitly built-in assumptions that only capture certain situations, so will not prove the result in sufficient generality. In these cases, the picture can be useful supplement to help the reader parse the argument, but the verbal argument should be self-contained.
- If your proof has a conceptually difficult step, consider explaining the step both in general, and in a specific example or special case. The special case may be, strictly speaking, mathematically redundant – but it can help the reader understand the proof.
- If your proof has multiple steps, consider explicitly breaking it down into numbered step, with a clear statement of the assumptions and goals of each step. Or, consider writing intermediate steps as ‘Lemmas’, with precise and self-contained statements, and separate, self-contained proofs. Modularizing your argument in this way can make it easier for the reader to follow each step, and to discern the overarching logical structure of the proof.