

Homework in Math 131A, Spring 2024

Expectations. To do well in Math 131A, you should expect to do **at least:**

14–16 hours of work each week outside of class.

Outlining and revising homework. You will have several chances to work on, and revise, all homework problems. Specifically, this process has 3 steps: outline, submission, and revision.

1. An outline of each problem set will be due the class before the completed version is due. For example, the outline for problem set 01 is due **Wed Jan 31**, and the final version is due **Mon Feb 05**. In each outline, you should do the following:
 - (a) **Write down the definitions of all new terms in the reading that goes with each problem set.** You do not need to repeat definitions that have appeared before, just new ones. Also, **please do not write out the theorems** from the reading. Finally, please put the definitions in a section separate from the rest of the outline.
 - (b) **Write down a plan for every problem.** The way you do this depends on the problem. (In particular, you need to do enough work on a problem to tell what methods are needed!) We will discuss all you need to know about definitions, theorems, assumptions, conclusions, and methods of proof as we go along; see also the coursepack notes on proof.
 - If the problem is a computation, just note what needs to be computed.
 - If the problem is an “if-then” proof, write down what you are **assuming** in your proof, and write down the **conclusion** you are trying to reach.
 - If the problem involves proving that “There exists (blah blah)”, write down the name of the object that you need to construct, and write down an assume-conclude structure for the properties that the constructed object needs to have.
 - If the problem involves proof by contradiction, write down the initial assumptions that you hope will lead to a contradiction.
 - If the problem involves proof by induction, write down an outline for the base case of the induction (usually either “there exists” or “if-then”), and then write down an assume-conclude pair for the induction step.

Late outlines will not be accepted, but your lowest outline grade will be dropped.

2. Submit the completed version. (For PS01, this will be on **Mon Feb 05**.) This should consist of proofs written in **complete sentences**; do not include the outline. Note that equations are complete sentences, i.e., do not artificially turn equations into words.
3. After you get the graded problem set back, you have as many chances as you want to revise the problems as much as you like, usually until the class before the next in-class exam. (For example, the last chance to revise PS01 is **Mon Feb 26**.) Each time you submit a revision, please attach the original completed version and all previous

revisions, so I know how many points to add on to your score. (Please arrange the versions with the **newest on the top**, down to the original version on the bottom.) You do not need to revise/rewrite problems that you have previously gotten correct; just correct the ones you got wrong.

Revising missed problem sets: It is possible to “revise” a problem set that is not turned in on the due date. However, each time you miss a due date, all previous homework from missed due dates becomes unrevisable. Note that “missing” a due date can also include turning a homework that, in my judgement, does not represent a sufficient effort to continue with the course. (I’ll let you know quite clearly that your effort is insufficient if it happens.)

Rules for working together: The basic rule about working together is that you are encouraged to talk to each other about homework, as everyone learns from such discussion, but you are not allowed to copy solutions. Please also do not let others “borrow” or make xeroxes of your homework.

COPYING IS CHEATING: COPYING ANSWERS FROM OUTSIDE SOURCES IS ALWAYS CHEATING. This includes, but is not limited to, copying from tutors, copying from other textbooks, copying from the Internet, getting answers online, and using AI chatbots.

There may be times this semester when you feel like you are struggling with the homework in this class. *That struggle is part of the point of the homework.* One of the best ways, and maybe the only effective way, to learn a creative subject like analysis is to struggle with the ideas and problems. That’s one of the main reasons I don’t want you to copy answers, even on homework — that kind of cheating deprives you of an important opportunity to learn. And conversely, the fact that we are flipping the class gives you plenty of opportunity to get help with the homework, both from me and from your classmates.

Consequences: Homework copying will result in a grade of 0 both for the person copying and the person being copied from. After repeated offenses, I will file a report of academic dishonesty with the university. Offenses on exams will result in my filing a report with the university, and may result in your immediate failure of the class.

Recap:

Stage	Defns?	How much of proofs?
Outline	New defns	Assumptions and conclusions only.
Completed	None	Submit entire finished proof.
Revision	None	You only need to write down new versions of problems for which you have not already received full credit.

Remember: Homework accounts for 20% of your final semester grade. If you miss even a single problem set, this can lower your semester grade by one “notch” (A to A–, etc) or more. Don’t think of problem sets as just homework, to be done only for yourself; think of them as being like papers in a humanities class. To repeat: **YOU HAVE TO DO EVERY SINGLE ONE OF THE PROBLEM SETS.**