

MATH 110B—WRITING ASSIGNMENT 07

Due: Sunday October 27, by 7PM

Getting Started

1. Get the template for this assignment. Here's how to do it:

- Go to <https://v2.overleaf.com/>, and **make sure you are logged in**.
- In a new window, go here:

<https://www.overleaf.com/read/kprptmwwzzns>

- Click on the menu icon in the upper-left and select “Copy Project”
- When ask for a name, choose something like “Math 110B - WA 07” and click “Copy”
- When this completes you will be back in your own workspace (instead of mine).
- After solving the problem(s), type them up using the template.
- Email me your final draft.

2. Let me know if you have any questions!

If you have trouble finding the command for a math symbol you want to use, try looking in this document:

<http://mirror.hmc.edu/ctan/info/short-math-guide/short-math-guide.pdf>

Please type up your proofs to the following problems in L^AT_EX. Take care to use complete sentences and appropriate punctuation, and make sure to edit for typos. Email me your final draft. *Please let me know if you have any questions!*

1. Assume R is a commutative ring with $1 \neq 0$. If the only ideals of R are $\{0\}$ and R , then R is a field. (This is only half of Theorem 5.85.)
 - You need to show that every nonzero element of R has a multiplicative inverse. To get started, let a be a nonzero element of R . You want to show that there exists some $b \in R$ such that $ab = 1$. Now, by Theorem 5.82, the set $I = \{ar \mid r \in R\}$ is an ideal. What do the hypotheses imply about I ? Keep going.
 - *Make sure to clearly state when you are using a definition, lemma, theorem, corollary, or fact from the notes.*