

GETTING L^AT_EX

As I mentioned in class, I will award extra credit (in the form of “full redos”) to assignments written up using the T_EX typesetting system. (Pronounced “Tech”, and “Lah-Tech”.) I will not award extra credit for using Word, etc.

Here is how you get started:

1. IF YOU HAVE WINDOWS

- Go to <http://miktex.org/download> and download the “basic MikTeX installer”, and install.
- In the same email you found this document, find the file named `HomeworkTemplate.tex`.
- Save and open `HomeworkTemplate.tex`. It should automatically open with a program called TeXworks (which was installed as part of the MikTeX package). If not, open TeXworks yourself and then open the file. It is a very basic template that you can use to get started “TeXing” up your homework.
- The `.tex` file is where you will type. Anything with a `%` before it is a comment, so isn’t read when you compile. I have included some notes and hints for you using comments like this.
- Compile: To create the pdf (which is what you’ll turn in!), first make sure the drop-down menu in your toolbar says “pdfLatex”. Then either click the compile button in the toolbar (looks like a green block with an arrow) or press CTRL+T. If there are no compiling errors in your `.tex` file, then it should pop up with a pdf of the document and in the same directory where you saved `HomeworkTemplate.tex` should be three new files: `HomeworkTemplate.aux`, `HomeworkTemplate.log`, and `HomeworkTemplate.pdf`. These files will be updated every time you run latex on `HomeworkTemplate.tex`. Take a moment now to go to your directory/folder and check.
- You can now “save-as” the `.tex` document and rename it with “Homework 2”...or whatever, and get started!

2. IF YOU HAVE A MAC

- Go to <http://www.tug.org/mactex/> and download `MacTeX.pkg` and install it.
- In the same email you found this document, find the file named `HomeworkTemplate.tex`.
- Save and open `HomeworkTemplate.tex`. It should automatically open with a program called TeXShop (which was installed as part of the MacTeX package). If not, open TeXshop yourself and then open the file. It is a very basic template that you can use to get started “TeXing” up your homework.
- The `.tex` file is where you will type. Anything with a `%` before it is a comment, so isn’t read when you compile. I have included some notes and hints for you using comments like this.
- Compile: To create the pdf (which is what you’ll turn in!), click “Typeset”. (Or Command-T). If there are no compiling errors in your `.tex` file, then it should

pop up with a pdf of the document and in the same directory where you saved HomeworkTemplate.tex should be three new files: HomeworkTemplate.aux, HomeworkTemplate.log, and HomeworkTemplate.pdf. These files will be updated every time you run latex on HomeworkTemplate.tex. Take a moment now to go to your directory/folder and check.

- You can now duplicate the .tex document and rename it with “Homework 2” ...or whatever, and get started!

3. IF YOU WANT TO USE OVERLEAF INSTEAD

- Go to <https://www.overleaf.com/>
- Click “sign up” at the top. You can use your google or twitter account, or just create log-in info.
- Once you’re signed up and signed in, click “New Project” and choose one of their templates. OR in the same email you found this document, find the file named HomeworkTemplate.tex and save it to your computer. Open it with notepad, etc and copy-paste the contents into the panel you see on the left of your project in Overleaf.
- The HomeworkTemplate It is a very basic template that you can use to get started “TeXing” up your homework.
- The .tex file (in Overleaf shown on the left) is where you will type. Anything with a % before it is a comment, so isn’t read when you compile. I have included some notes and hints for you using comments like this.
- Overleaf automatically compiles (you can adjust the setting to manual if you prefer). If there are no compiling errors in your .tex file, then it should pop up with a pdf of the document on the right-hand side of the screen.
- On the “My Projects” screen, you can copy projects and rename them (e.g. for Homework 2!)

4. COMPILING ISSUES

TeX can be very frustrating because it is a very picky typesetting program, so lots of small things can cause compiling errors. Keep in mind that there is a learning curve - it may take a while at first, but after a couple assignments, it will be much easier. If you plan on continuing with math, your future professors will love you for TeXing your homework, and you will love yourself for learning early when it comes time to write up a research project!

Here are a few tips:

- 1) Any math should be inside \$ signs. For example, Typing

Consider the equation $2+x=5$.

will print the following:

Consider the equation $2 + x = 5$.

- 2) To write math on its own line (centered), type your expression inside $\[\]$. For example, if you type:

Consider the equation `\[2+x=5\]`

it will show up as:

Consider the equation

$$2 + x = 5.$$

3) Aside from general formatting (the \$ signs make $2+x=5$ into a more aesthetically pleasing $2 + x = 5$), the use of \$ or other math environments like `\[\]` allow for using special symbols. Here are some examples:

Symbol needed	What to type
\wedge	<code>\wedge</code>
\vee	<code>\vee</code>
\sim	<code>\sim</code>
\simeq	<code>\simeq</code>
\cong	<code>\cong</code>
\in	<code>\in</code>
\ni	<code>\ni</code>
\subseteq	<code>\subseteq</code>
\supseteq	<code>\supseteq</code>
\subset	<code>\subset</code>
\leq	<code>\leq</code>
\geq	<code>\geq</code>
\neq	<code>\not=</code> or <code>\neq</code>
\notin	<code>\not\in</code>
$a \mid b$ (i.e. a divides b)	<code>a\mid b</code>
$a \nmid b$ (i.e. a doesn't divide b)	<code>a\nmid b</code>
\Rightarrow	<code>\Rightarrow</code> (note the upper case!)
\rightarrow	<code>\rightarrow</code> (note the lower case!)
\Leftarrow	<code>\Leftarrow</code>
\leftarrow	<code>\leftarrow</code>
\Leftrightarrow	<code>\iff</code>
\mathbb{Z}	<code>\mathbb{Z}</code>
\mathbb{N}	<code>\mathbb{N}</code>
\mathbb{R}	<code>\mathbb{R}</code>
$\{$	<code>\{</code>
$\}$	<code>\}</code>
$\frac{a}{b}$ (a fraction)	<code>\frac{a}{b}</code>

Keep in mind that in order to use any of the above symbols, it has to be within a math environment. E.g, you'd want to write `\$P\wedge Q\$` to get " $P \wedge Q$ " or `\[P\wedge Q\]` to get it's own line:

$$P \wedge Q$$

There are many others, but you get the picture - you can search online, look at the Macros listed in your editor, or come ask me! You can also make your own macros. For

example, at the beginning of the .tex document, before `\begin{document}`, type the following:

```
\newcommand{\Z}{\mathbb{Z}}
```

Now anywhere inside the document you want the \mathbb{Z} symbol, you just have to write `\Z` instead of the full `\mathbb{Z}`.

Also, if you want big parenthesis, etc, you can use `\left(` and `\right)` instead of `(` and `)`, etc.

For example: typing `\left(\frac{\frac{5}{10}}{2-x}-3(x-6)\right)` gives:

$$\left(\frac{\frac{5}{10}}{2-x}-3(x-6)\right)$$

But typing `\left(\frac{\frac{5}{10}}{2-x}-3(x-6)\right)` gives

$$\left(\frac{\frac{5}{10}}{2-x}-3(x-6)\right)$$

If you want to denote a set, say $\{1,2,3\}$, you need to use `\{` and `\}` instead of just `{` and `}`, because the `{` symbols have meanings within the coding of the .tex file.

So `\{1,2,3\}` gives $\{1,2,3\}$.