

Overview of $\text{\LaTeX}$

1. What is $\text{\LaTeX}$?

LaTeX is a word processing program (really several programs) for scientific typesetting. It is used primarily in Math and Physics, although other disciplines will use it occasionally.

2. Why $\text{\LaTeX}$?

This is a free, machine-independent word processing package designed for mathematics. Other programs, such as Microsoft Word, were not put together with this in mind (although they do have add ons, such as the Equation Editor, to try to deal with math). LaTeX will produce professional looking documents- You may want to use it on your own computer. See our class webpage for more details.

3. How does LaTeX work?

- Type a text file, name it as `filename.tex`
To produce a document using LaTeX, you first create a simple text file using any text editor. We will use `TeX-Maker`. This file contains typesetting commands, text, and commands to produce mathematical symbols, equations, and you can include external graphs.
IMPORTANT: Your final product may not look anything like what you see in the text document.
- Compile the LaTeX code, create a DVI file:
Once the text file has been created (usually with a `*.tex` suffix), you run a program (**`latex file.tex`**) to convert the text into a mathematics document (with a `*.dvi` suffix). This is the document that you can convert to other file types to view or print.

4. A First LaTeX Document

- Open `TeX-Maker`. Take a few moments to look it over. You will type in the main window, and you will use some of the buttons at the top to do the two steps we talked about.
- The following lines are *required* in LaTeX and will appear in every LaTeX file:

```
\documentclass{amsart}  
\begin{document}  
  
\end{document}
```

- Now fill in some text. The following is a statement of the Mean Value Theorem. This also shows you the format you'll use in writing up your labs.

```
\documentclass{amsart}

\title{The Mean Value Theorem}
\author{Your Name(s) Go Here}

\begin{document}

\maketitle

{\bf THE MEAN VALUE THEOREM.} Let  $f$  be a continuous function on the
interval  $[a,b]$ , and differentiable on  $(a,b)$ . Then there is a  $c$ 
in  $(a,b)$  so that:

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

\end{document}
```

- Save this file as `MVT.tex`
 - To compile the tex file, press the button marked `LATEX`
 - To view the results, press the button marked with a lion (this is a DVI viewer).
 - Create a PDF document by pressing the `PDFLAT` button, then check to make sure you can view it.

5. Look closer at the code we just typed:

- To create boldface text, we used: `{\bf text }`
- To set off mathematics variables and put them within a line of text, use single dollar signs: `$ math text $`
- To set off mathematics on its own line, use double dollar signs: `$$math equation$$`
- A fraction was created by: `\frac{ numerator }{ denominator }`
- Regular text doesn't need anything special, unless you want it to be a title or something.