Math 235: Introduction to LaTeX

The LaTeX word processing system was built to do mathematical typesetting. It is different than word processors; in LaTeX you type in text and typesetting commands, then the program builds the pages of text, then you can view the end result- That is, LaTeX does not work as a "what you see is what you get" (or WYSIWYG) kind of processor. We'll follow the steps below to build a document:

• Use a regular text editor (we're using Texmaker) to type in words, mathematical notation, and other typesetting commands. Save this plain text document with the file suffix .tex

(Our example file is called Template.tex)

• Run the LaTeX program on the tex file, either by pressing the Quick Build button in the editor or by going to Tools -> Latex in the menu.

What happens is that LaTeX builds a file called a DVI file (DVI stands for Device Independent). We typically don't view the DVI file, we usually take one more step and build the PDF file.

• Texmaker can be programmed to do both of these steps for you. Go to the menu options at the top of the monitor, and select Options -> Configure Texmaker

Once in the configuration menu, select the second button on your left (this is the Quick Build button), and then you have lots of choices. I rather like the Pdflatex + View PDF option.

You can test these options on the template file- Try it out.

Modifying the Template

You might save your file with a new name to keep the original template file as it is. Next, modify the template by typing the following:

```
\documentclass[11pt]{article}
\usepackage{graphicx, fullpage}
\title{The Mean Value Theorem}
\author{Your Name(s) Go Here}
\begin{document}
\date{\today}
\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}
```

\$\$
{\bf Discussion:} In order to use the MVT, we see that there are two
hypotheses that must be true:
\begin{itemize}
\item The function \$f\$ is continuous on \$[a,b]\$
\item The function \$f\$ is differentiable on \$(a,b)\$.
\begin{itemize}
\item This means that \$f\$ may not be differentiable at \$a\$ or \$b\$.
\item Second note
\end{itemize}
\end{itemize}

 $\end{document}$

Save this file as MVT.tex. and use Texmaker to compile the tex file and produce a PDF file (use your folders to make sure these files have been constructed).

Notes and Questions:

• The following lines are NECESSARY for every latex file:

```
\documentclass{article}
\begin{document}
```

 $\end{document}$

The option article may be changed to amsart or a different option

- What happens if you delete the \maketitle command? (Try it)
- To create boldface text, we used: {\bf text }. Notice that these are *curly braces* and not parentheses.
- 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:

```
$$ math equation $$
```

- What happens if you use \[and \] in place of the double dollar signs? (Try it)
- What happens if you replace \[, \] in the last item with \begin{equation} and \end{equation}? (Try it- You may have to press the LaTeX button a couple of times).
- A fraction was created by: \frac{ numerator }{ denominator }

• A "bulleted" list is created by the use of itemize. Try changing one begin-end pair to use enumerate instead of itemize.

We'll typeset some more, but first let's introduce an error so we can see what it looks like.

Finding and Fixing Errors

Put some white space here:

\begin{equation}

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

and try to run LaTeX- You should see Process exited with error(s) in the Message Window, and the errors are listed in red- in this case, it actually points to the wrong line, so you can see that sometimes the error message doesn't correspond exactly to what is wrong.

HOMEWORK:

We will have some time next week to continue working in LaTeX, and the homework is due on the Monday following that. What should you do?

- Watch the LaTeX video tutorials that are linked from the class website. There is some excellent information there (and quite a bit of information!). Be sure to see these videos before class next week.
- The goal, after you have viewed the tutorials, is to construct a sample LaTeX document so that the PDF output looks like the PDF file on our class webpage (it is your PDF document and tex document that you will upload to your CLEo account).
- To help you, you should work with your partner, you can do internet searches for LaTeX commands, you can use the blue book on each desk, and if all else fails, you can ask me and I might be able to point you in the right direction.