

Introduction to Calculus Lab, Part I

Goals for the first part of class (details follow)

- Get into groups of at most 2.
- Brief notes about the syllabus.
- Be able to log in and out (and in again).
- Be able to change your password.
- Customize the toolbar by adding icons for Maple, Matlab, Firefox, TeX-maker, and a shell (terminal) window.

Log in and out

Log in using your usual Whitman login name, and your assigned password.

Be sure to log out after every session! You can either use the red button in the upper right corner of your desktop, or go to **System**→**Quit**

Change Your Password - Modify the Toolbar

First, we need a window in which we can type some commands. We will want to create an icon on our upper toolbar so this will be easy to access. From the upper left menu, choose the following, then drag the **Terminal** icon to your toolbar.

Application→**Accessories**→**Terminal**

Left-click the icon we just put on the toolbar, and a window should open on your desktop (the name of your computer will appear). We will be using command lines to change the password:

Type: **kpasswd**

The first password asked for is your current password, then follow the instructions.

Be sure that you can log in using your new password- At this step, log out, then log back in.

Firefox, Maple and TeX-Maker

Find the desired icon under either **Applications** or **Actions**, then use the mouse to drag it to the toolbar:

- Use Firefox to get to our class website, and bookmark it (you can find it from the department website if needed):

<http://www.whitman.edu/~hundlejr/courses/M235.html>

- Find the Maple icon, and put it onto the toolbar. (We won't use the program until next week).
- Repeat for the software called "Matlab" and the text editor called "TeX-Maker" (or Texmaker).

Introduction to Calculus Lab, Part II

Goals for the second part of class:

- Be able to navigate through your files (be able to create and remove file folders)
- Download files from the class website into the desired files.
- Understand the interface to Maple. Be sure the settings are correct.
- Understand the text editor interface (Texmaker). Be sure the settings are correct (we'll go through them below).

Navigation, files and folders

There are several ways of creating folders and navigating the directory structure in Ubuntu. You may use the *File Browser* which is very similar to Windows or Apple, or you may use a command line window using a *Shell*. Using the command line is very fast, but you need to know some Unix commands.

- Use the *File Browser* to create a file folder *MathLab*, and then create a subfolder called *Lab01*.

HINT: Do not use whitespace in folder or file names!

These are BAD:

Math Lab File 1.tex my document.tex

These are GOOD:

MathLab File01.tex my_document.tex

The Class Website

- Go to our class website: <http://people.whitman.edu/~hundredr/courses/M235.html> and bookmark it.
- Find the template latex file: `Template.tex`, and download it to your **Lab01** folder *NOTE:* Right click the mouse on the hyperlink, and choose **Save Link As**
- Find the initial Maple file, `MapleExample01.mw`, and download to your **Lab01** folder.

Set up Maple

- Open Maple, and choose **Worksheet** in the initial dialog box.
Go to **Tools**->**Options**, then find the **Interface** tab.
Set the **Default format for new worksheets** to *Worksheet*.
Find the **Display** tab, and set **Input display** to *Maple Notation*.
Select the **Apply Globally** button at the bottom, and exit from Maple.
Open Maple, and you should be taken directly to a “Worksheet”, and you should see a red symbol >. If you see that, you're done with this part for today.
- Before going any further, be sure that all the members of your group have done the first two parts.

A First LaTeX document

- Open TeXMaker.
- Start a new tex file: Go to File -> New by copying existing file and choose the template file we just downloaded to our Lab01 folder.
- Now fill in some text between the begin/end document lines so that your document looks like this:

```
\documentclass[12pt]{article}

\author{ Your Names Here }
\title{Introduction to Lab}
\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:

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


{\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
 - To compile the tex file, press the blue arrow to the left of *Quick Build*.
 - If a viewer does not open, it means something is wrong- Let me know.
 - Create a PDF document by going to Tools, then PDFLatex (or F6). View the PDF file by going to Tools, then View PDF (or F7).

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}
\end{equation}
```

and try to run LaTeX- You should see **Process exited with error(s)** in the Message Window.

Press the button with the green graph- This allows us to see what the LaTeX errors were- We see there is a problem with Line 15 (may be a different line on your document)- And this is the line at which we put the extra white space. Remove the white space and re-run, and the error should go away.

NOTE: Sometimes the error messages are a little cryptic, and may be entirely wrong. Usually they at least give you an idea of where to start