

Mathematica for Vector Calculus: Getting Started with the Computer (IT Labs Version)

This document will provide you with the basic information to aid you in logging into the computer and starting Mathematica on the computer. It will also explain how to download the first lab assignment, which will introduce you to Mathematica and explain how to use basic commands.

LOGGING ONTO THE COMPUTER

Activating Your Account. Your lab meets in an IT computer lab, which means you must follow all rules and regulations of the IT Labs.

Now, we hope that you have already activated your account. If you haven't, all is not lost (but the process of activating your account takes awhile, so some of the class time will be lost). You can activate your account now. (At the end of each semester, your IT account is deleted so it must be re-initialized at the beginning of each new semester.) If you need to activate your account, type the username

`register`

and then hit return. In the space for the password, simply hit return. This should enable you to now follow the directions to get a login name and password.

If this process does not work, there's an alternative way to activate your account. Find some way to use a web browser on another computer, and go to the web page:

`http://www.itlabs.umn.edu/`

Click on the link *IT Labs Account Creation Form* and follow the instructions. Note that it can take up to 24 hours for your account to be activated, although usually it works within 30 minutes. All computer accounts should be activated by the second day that you meet with your recitation/lab instructor.

Logging On. Once your account is activated, you can log on to the computers. But, **BEFORE YOU LOG ON**, click on "Options" in the lower left hand part of the screen, and click "Select Session." Select "GNOME." Then type your ITLABS Unix username and password. (If it asks about changing the default setting to GNOME, click Make Default.) If you remembered everything correctly, you will be logged in and see the Gnome environment on your screen.

OBTAINING NOTEBOOK FILES FOR MATHEMATICA

Your first laboratory assignment will be to work through Lab 1A, which contains a brief introduction to Mathematica. You can obtain the Mathematica files (called "notebooks") you will need for this lab from the web. Start the Firefox web browser by using the Applications menu in the upper left hand corner of your screen (look under Internet). Next, type in the URL

`http://math.umn.edu/math2374`

Scroll down and find the link for math2374.nb from the Labs section. Use the RIGHT mouse button to click the link and select **Save Link As** from the menu that pops up. Then, click the **Save** button to save the file to your home directory. Similarly, RIGHT-click the link for Lab 1A and save that file also to your home directory.

GETTING IN AND OUT OF MATHEMATICA

Using a terminal window. Sometimes you will need to type certain commands (such as `mathematica`). Open a Terminal window by using the Applications menu (look under Accessories). You can type commands in the terminal window.

Running Mathematica. To run Mathematica type `mathematica` at the prompt in a terminal window. This will open a Mathematica notebook in which you can enter Mathematica commands, receive Mathematica output responses, type in text, etc. You can use Mathematica in any other IT computer lab; see their website (above) for a list of IT labs. Your course instructor is from the math department, and therefore in most cases will not be able to answer questions about IT Labs.

Later, to exit Mathematica, you can select **Quit** from the **File** menu (clicking the X in the upper right of the window won't work).

USING MATHEMATICA NOTEBOOKS

First load math2374.nb. Before working with any notebook in this course, the first step is to load the commands from the `math2374.nb` notebook. Open the notebook in Mathematica by choosing **Open** under the **File** menu. Click on `math2374.nb` in the list and click OK.

Load the command by clicking the button "Click Here to Load Math 2374 Commands." Wait until it says it is finished. Then, close the `math2374.nb` notebook by clicking on the X in the upper right corner. Since you don't need to save changes to `math2374.nb`, click "Don't save" when prompted. Follow this procedure every time you start Mathematica and before you use another notebook from this course.

Opening a Mathematica Notebook. Now you can open the `Lab_1A.nb` notebook in Mathematica using the same procedure. If you choose **New** from the **File** menu you can open another notebook where you can type commands while reading the lab. The most important thing that you should remember is that Mathematica is **VERY SYNTAX SENSITIVE**. If you get an error, most likely you have made a mistake in your syntax. Check capitals and parentheses very carefully.

Note: make sure your Num Lock is turned off or the mouse won't work properly.

Saving a Mathematica Notebook. When it comes time to end your Mathematica session, you may want to save your notebook with any changes that you have made. Since saving Graphics output takes up a tremendous amount of disk space you should **NOT** save notebooks which have graphics output. You only have a certain amount of disk space for your account; if you use too much, then you will not be able to login. We can help you fix this, but you may lose some of your data.

To save a notebook without output you must first select **Delete All Output** from the **Kernel** menu and then you can save the notebook by using the **File** menu and selecting **Save As**. The next time that you open your notebook, you can easily restore the output by selecting **Evaluation** from the **Kernel** menu and selecting **Evaluate Notebook**.

Printing. You are not required to print anything out in this course. All graphs and calculations should be carefully transferred to your lab write up by hand. Make sure you take very good notes (clearly label all graphs, etc.) while you are in the lab so that your lab write up will be understandable. If you do wish to use printouts from Mathematica, your TA will be able to give you a few ideas on how to do this.