Mathematica for Vector Calculus: Getting Started with the Computer (Math Dept 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

The first thing that you must do in lab is to login to your account with the username and password given to you by your instructor. To do this, type in your username at the Username prompt, hit return and then type in your password at the Password prompt and hit return. You should now have a screen with a toolbars along the top and the bottom of the window.

Using a terminal window. Sometimes you will need to type certain commands (such as passwd, below). Open a terminal window by RIGHT-clicking the desktop, and clicking Open Terminal. You can type commands in the terminal window.

Changing your password. Once you have logged in and opened a terminal window, you should immediately change your password by typing

```
passwd
```

at the prompt. You will be asked for your old password, then asked to type your new password twice. You should change it to something that you remember, although simple passwords will be rejected by the system. A good password should contain punctuation symbols, numbers, and/or capital letters.

If you forget your password, neither your TA nor your lecturer can reset it; well have to send you to the Systems Staffs office in Vincent 11.

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). Go to the course Moodle site: type in the URL

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moodle.umn.edu
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Log in there with your Internet ID. Once logged in, you will be able to see the links to the course website.

Find the link for math2374.nb from the "Information on 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 (on the main course page, in the segment for the first week of classes) and also save that file to your home directory.

Using Mathematica

Running Mathematica. To run Mathematica, go to the Applications menu, and click on Mathematica, which you can find under Other. This will open a Mathematica notebook in which you can enter Mathematica commands, receive Mathematica output responses, type in text, etc.

Later, to exit Mathematica, you can select **Quit** from the **File** menu (clicking the X in the upper right of the window wont work).

Finding computers with Mathematica. You can use Mathematica in this lab whenever it is open. You can use Mathematica in the Vincent 314 lab (your TA will give you the code for the door). Mathematica is also available in any CSE computer lab; see their website (`www.cselabs.umn.edu`) for a current list of their facilities. Note that since CSE labs have a different computer system, you cannot directly access files that you have saved on the Mathematics department computers.

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 dont need to save changes to math2374.nb, click Dont save when prompted. Follow this procedure every time you start Mathematica and before you use another notebook from this course.

Note: make sure your Num Lock is turned off or the mouse wont work properly.

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.

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 **Cell** 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 **Evaluate Notebook** from the **Evaluation** menu.

Submitting a Mathematica notebook. Your labs should be written up in Mathematica according to the course grading guidelines. Try to make the resulting labs as readable as possible. In particular, delete any extra output or error messages.

Go to the course Moodle site and look under the first week for **Practice lab submission**. Click the **Browse** link and select the file Lab_1A.nb on your desktop. Click **Upload this file** to submit your lab for grading.

Printing. You are not required to print anything out in this course. 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 create printouts from Mathematica for your own use, your TA will be able to give you a few ideas on how to do this.