Introduction to Math 242
Math 242 -- Section 1, Spring 1995

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Math 242 is a course in differential equations. We will not, however, see any differential equations until the second week of the semester. The first week will be spent introducing the computer tools that will be used in this course and to review fundamental topics from algebra and calculus.

There are three main computer tools that will be used: electronic mail, the World-Wide Web, and Maple. Many of you are already familiar with e-mail; I hope each of you will make use of e-mail to supplement our face-to-face communication.

The World-Wide Web (WWW) is an exciting new resource. It's even easier than e-mail; if you can use the mouse, you can ''surf the net''. Our primary use of the WWW will be to view and download handouts, assignments, and other files (such as this one).

Maple is a computer algebra system that will be used to assist with some of the tedious calculations that will arise in the process of solving differential equations. In this sense, Maple is to differential equations as a calculator is to arithmetic. Maple is much, much more. We will be using Maple to program numerical methods for approximating the solution of a differential equation as well as to generate graphical representations of differential equations and their solutions.

The following exercises have been selected to initiate the process of developing a foundation for the use of e-mail, the WWW, and Maple. Each of us (myself included) will encounter difficulties as we learn about these tools. These battles can be very frustrating if you try to fight them alone. I encourage you to seek the help of your classmates.

1. *WWW*

A WWW browser can be used to view this document electronically. The browser currently available on the ENGR network is NCSA Mosaic. To run this program, open the **Internet** folder in the Program Manager, then double-click on the **NCSA Mosaic** icon.

There are a number of ways in which you can access this document. From the Engineering Home Page (which is the default home page displayed when Mosaic is started), follow the link to (i.e. click on the highlighted text) **USC Local Information**, scroll down this list until you find **USC Dept of Mathematics Home Page** (not the USC Department of Mathematics Gopher Server).

To finally view the actual document from which the printed copy in your hands was created, follow the following links:

- **Course Materials**,
- **Math 242 (Section 1)**, and (finally!)
- **Day 1**.

It is possible to jump directly to any home page, if you know the Universal Resource Locator (URL). For example, the URL for the home page for this course is:

`http://www.math.scarolina.edu/ meade/math242/`

This page will contain many of the documents needed for this course, including homework and project assignments and homework solutions as they become available. The URL for the home page we are currently viewing is:

`http://www.math.scarolina.edu/ meade/math242/day1.html`

To jump directly to a home page whose URL is known, select **Open URL** under the **File** menu. A popup window will appear; in the input region, type the appropriate URL -- *with absolutely no errors*.

Since you will be referring to this page on a regular basis, it would be nice if there were a way to directly access this home page. In theory this is possible. In practice, the ENGR network is not setup to permit this. The support staff and I are working on a solution.

2. *E-mail*

Since I am unable to be in class today I want each of you to introduce yourself to me in an e-mail message. In that message, I want you to provide the following information

- your preferred name (what you want to be called);
- a telephone number where you can be reached;
- your e-mail address;
- your major;
- at least one skill or item of knowledge that you hope to learn in this course;
- your biggest concern (or fear) about this course;
- the list of all Math courses you have taken, including when and where you took the course, the name of your instructor (if at USC), and the grade you received;
- your schedule for this semester (sample);
- times which would be most convenient for me to hold office hours;
- at least one interesting (non-academic) fact about yourself;
- any other information that you want to include.

My e-mail address on the ENGR network is `meade`

This is your first homework assignment. The due date is midnight tonight **11:59:59pm Monday,**

January 16, 1995. Yes, midnight tonight. The reason for the quick due date is simple: I want to compile your responses, so I can select office hours and distribute the syllabus on Wednesday.

Follow this link to see my responses to the questions.

3. *Maple*

Maple is a computer algebra system that we will use in a variety of ways. Our first use will be to assist with tedious and sometimes messy algebra and calculus operations. This does not mean that you don't have to know how to do the problems by hand; it just means that you will now have a new tool that you can use when the calculations become complicated.

I see computer algebra systems fulfilling the same role in calculus and differential equations as the calculator plays in arithmetic. To be more specific, think about how you would compute the product of 123456 and 654321. This is not a difficult problem, but it would be tedious to work by hand. It's much simpler to use a calculator. Try it. (But, does your calculator find the correct answer? Explain.?)

In this same sense, Maple does not enable us to solve any problem we could not solve by hand; it is, however, a tool that can simplify the work involved in solving a problem when used appropriately.

For the purposes of a today's introduction, I want you to download a Maple worksheet from the WWW. (Maple worksheet are identified by the extension `.ms`)

Downloading a file from the WWW is as simple as anything else with the WWW -- just push a button (OK, two buttons). Maple worksheets are not meant for human interpretation, so there is no sense asking Mosaic to display the file. Instead, you want the file downloaded to your local machine. Since Mosaic can't read your mind, you'll have to inform Mosaic of this change. The shortcut is to hold down the *Shift* key when you click on a link in the document. (If you forget the shortcut, you can always select **Load to Disk** from the **Options** menu. Then, whenever you click on a link, the corresponding file will be saved on disk.)

The file we want to download is day1.ms. You will be prompted for the location to store this file. The default location is `c:/temp/day1.ms`, but you will probably want to save the file somewhere on drive `h:` (i.e. in your account's disk). Regardless, you will need to remember the name and location of the file.

To learn how to use the file you just downloaded, begin to read the Maple document that you should be receiving from Bob.

Final Comments

This completes your introduction to the WWW. But, that's not all. Bob Murphy has two more documents for you. The first is just a single page with five homework problems that will be due at the beginning of Wednesday's class.

The second provides more information about Maple, including how to use the file you just downloaded.

Use the remaining time in today's class to begin to work through this document. Have ideas about how to answer the questions interspersed throughout the document. We will discuss these in greater detail in Wednesday's class. (It would be a real mistake to not devote some time to this!)

Don't forget to send e-mail to `meade` *with the information requested.*

If you have any questions, please send e-mail to `meade@math.scarolina.edu`

Last modified: 14 January 1995