

Mathematica

Math 321-A

Spring, 2003

Mathematica is a very powerful program that is on many of the lab machines on campus. Since it can do so much, it can be difficult to figure out how to use. Here are some guidelines:

1. When in doubt, use the *Help Browser* to do a keyword search. You will see examples of the various commands this way.
2. Built-in commands are always capitalized.
3. A command is not executed until you do a shift-return.
4. Ranges for plotting, integration, etc. are always written as lists in braces, e.g. `Plot[x^2, {x, -2, 3}]` is the command for plotting x^2 with x ranging from -2 to 3 .
5. To define a function, you need to use an underscore with the variable on the left-hand side: `f[x_] = x^2`. The underscore tells **Mathematica** to replace any x by whatever the input is to the function. Otherwise `f[x] = x^2` will only work when the input to f is x .
6. Parentheses are used only for grouping; functions and commands both use square brackets.

Please perform the following tasks. Remember to use the *Help Browser* to find the exact form of the command, and then write the command in a special section of your notes for **Mathematica**.

1. Define $f(x) = x/(1+x)$ and evaluate it at $x = 1, 2, \dots, 10$.
2. Plot the graph of $f(x)$ from the previous exercise for x running from -0.5 to 0.6 .
3. Integrate $f(x)$ over this interval.
4. Find its derivative in general.
5. Find its slope at $x = -0.1$.