

Introduction to MAPLE

MATH 256-01
Thursday, September 11, 2003

Here are some general guidelines for using MAPLE.

1. Commands always end with a semicolon (to show the output) or colon (to suppress the output).
2. Multiplication requires an asterisk (*); if you want $2x$, you must type $2 * x$.
3. The help system is excellent. In the exercises below, I've given you the command names to look up in help to get you started.
4. MAPLE can probably do anything you would expect it to; the work is in finding out how. Don't give up!
5. If you want to reference the prior result (like ANS on your calculator), use %; for the next to last result, use %% , etc.
6. To define an equality, use :=. For example, to let $x = 5$, you would type $x := 5$. (Without the period at the end.)
7. To define a function, use an arrow: $f := x \rightarrow x^2 + 1$ creates the function $f(x) = x^2 + 1$. You can then evaluate the function by just entering $f(3)$; (for example).
8. Sometimes you need to load packages to access the commands you want; this is done by typing

with(packagename):

The packagename should appear in the help system.

1. Let $f(x) = 3x^2 + 2$.
2. Create a graph of $y = \sin x$. Adjust the plot parameters to see what the effects are. (plot)
3. Graph $\sin x$ and $\cos x$ on the same set of axes. (plot)
4. Create a 3-D graph of $\frac{\sin^2(x)}{x^2 + y^2}$. Adjust the plot parameters to see what the effects are. (plot3d)
5. Find the root(s) of $x^4 - 7x^3 + 5x^2 + 2x - 9$. (Exactly and numerically.) (solve, fsolve)
6. Use MAPLE to differentiate $\frac{x^2 + 5x - 1}{e^x \sin(x)}$ with respect to x . (diff)
7. Use MAPLE to integrate $x^2 e^{-4x}$ with respect to x . (int)
8. Plot a direction field for $y' = \frac{4y^2}{y + 1}$. Then solve this DE with the initial condition $y(0) = 2$. (dfield, dsolve))
9. Express π to 100 decimal places. (Pi, Digits)
10. List all the prime numbers up to 100. (isprime, for..do..od, if)