

Useful Mathematica Commands

The most important thing to know in using Mathematica is how to define functions. To have f be the sine function, write

$$f[x_] = \text{Sin}[x]$$

One can also delay the evaluation of the function using a slightly different syntax:

$$f[n_] := \{1,2,3,4,5\}[[n]]$$

This function will recall the n 'th element of the list. However, Mathematica will complain if you take away the colon because it does not know what the n 'th element is if you haven't specified it.

Here is an example of an extremely useful Mathematica command:

$$x^2 + y^2 + y + z^2 /. y -> a + b$$

Mathematica will search for all instances of y in the formula before the $/.$ and replace them with $a + b$.

It is often useful to have Mathematica assume certain things are true. To have Mathematica assume that the variables x and y are greater than zero, put the following command in your Notebook:

$$\text{\$Assumptions} = \text{And}[x > 0, y > 0]$$

The Help feature, and in particular the Documentation Center, on Mathematica are very useful. However, to use them, you have to remember the names of predefined functions if not their syntax. Here follows a list of Mathematica commands I often use.

- Table
- Length
- Clear
- Assuming
- Join
- Simplify
- Expand
- Collect
- Coefficient
- Series

- SeriesCoefficient
- Normal
- D
- Integrate
- Sqrt
- Det
- Eigenvalues
- Eigenvectors
- Solve
- DSolve
- FindRoot
- FindMinimum
- FindMaximum
- FindFit
- NDSolve
- Plot
- Plot3D
- ListPlot
- ListLinePlot
- Export
- SetDirectory
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