Mathematica Quick Start

Double-click on the *Mathematica* icon to open *Mathematica*.
A blank sheet "Untitled-1" appears usually along with one or more palettes.

Mathematica uses capitals for the first letter of its built-in functions, commands, options, etc. (and first letter of additional words that are part of built-in items). **No spaces** in these commands.

      Plot   ParametricPlot Sin   Sqrt   TableForm   N   NSolve

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Mathematica uses **[ ]** to enclose the "argument" of a function.   Sin[x]

Mathematica uses **{ }** to enclose the contents of a "list". {1,2,3,4} {Sin[t], Cos[t]}

( ) are only used for grouping expressions.   Sin[x/(x+3)]

[, {, (must be used in pairs. *Mathematica* shades these until they are balanced.

Many mistakes made in using *Mathematica* are violations of one of the rules above.
So when you get an error in *Mathematica*, check these first.

Commands are entered into the blank sheet. Type   "2 + 3"

To submit a command for processing in *Mathematica*, press the "**Enter**" key **on the far right of the keyboard**. Try it. The first time you press "Enter" after opening the program, *Mathematica* will start its processing engine called the "kernel", so it will take a little longer to get results from the first command you enter.

Mathematica gives exact answers unless you tell it you want a decimal approximation. Try typing "Sqrt[2]". Enter. Now type "N[Sqrt[2]]". Enter. Default is 6 digits.

N[*expression*] finds the decimal value of *expression*.
NSolve[*equation,{ variables*}] finds the roots of an *equation*.   NSolve[x + 2 = = 5]
(NOTE: Equations must have 2 equal signs!!!!!)

Graphing:

  Plot Command: Plot[*functions*,{x, xmin, xmax}]

  Examples: Plot[Sin[x], {x, 0, 2Pi}] Plot[{Sin[x], Cos[x]}, {x, 0, 2Pi}]

  ParametricPlot Command: ParametricPlot[{f[t], g[t]}, {t, tmin, tmax}, *options*]

  Example: ParametricPlot[{Sin[t], Cos[t]},{t, 0, 2Pi}]
  Example w/option: ParametricPlot[{2Cos[t], t-Cos[t]},{t, 0, 2Pi}, PlotRange→All]

You can **define your own function** with ":=" . To avoid confusing *Mathematica*, start with a lower case letter. The definition must include the "underscore" after the variable.

   addTwo[x_]:=x+2   Now press "Enter". Now type "addTwo[5] and press "Enter"

Natural log base *e* is **E**, imaginary unit *i* is **I**, and π is **Pi**. Or use the *Basic Input Palette*.

Recommended: *Schaum's Outlines Mathematica* by Eugene Don