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Mathomatic Command Summary
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approximate - Approximate all numerical values in equation spaces.
Usage: approximate [equation-number-ranges]

calculate - Temporarily plug in values for variables and approximate.
Usage: calculate ["factor"] [variable number-of-iterations]
This command may be preceded with "repeat".

clear - Delete expressions stored in memory so equation spaces can be reused.
Usage: clear [equation-number-ranges]
Tip: Use "clear all" to quickly restart Mathomatic.

code - Output C, Java, or Python code for the specified equations.
Usage: code ["c" or "java" or "python" or "integer"] [equation-number-ranges]
Related commands: simplify, optimize, and variables

compare - Compare two equation spaces to see if mathematically the same.
Usage: compare ["symbolic"] equation-number ["with" equation-number]

copy - Duplicate the contents of the specified equation spaces.
Usage: copy [equation-number-range]

derivative - Symbolically differentiate and simplify, order times.
Usage: derivative ["nosimplify"] [variable or "all"] [order]
Alternate name for this command: differentiate

display - Display equation spaces in pretty multi-line (2D) fraction format.
Usage: display ["factor"] [equation-number-ranges]

divide - Prompt for 2 numbers or polynomials and divide. Give result and GCD.
Usage: divide [variable]
This command may be preceded with "repeat".

echo - Output a line of text, followed by a newline.
Usage: echo [text]

edit - Edit all equation spaces or an input file, then read them in.
Usage: edit [file-name]

eliminate - Substitute the specified variables with solved equations.
Usage: eliminate variables or "all" ["using" equation-number]
This command may be preceded with "repeat".

extrema - Show where the slope of the current equation equals zero.
Usage: extrema [variable] [order]

factor - Factor variables in equation spaces or factor given integers.
Usage: factor ["number" [integers]] or ["power"] [equation-number-range] [variables]
Alternate name for this command: collect

fraction - Convert expression to a single simple fraction.
Usage: fraction [equation-number-range]
Alternate name for this command: together

help - Short, built-in help and reference.
Usage: help [topics or command-names]

imaginary - Copy the imaginary part of the current expression.
Usage: imaginary [variable]
Related command: real
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integrate - Symbolically integrate polynomials order times, then simplify.
Usage: integrate ["constant" or "definite"] variable [order]
Alternate name for this command: integral

laplace - Compute the Laplace or inverse Laplace transform of polynomials.
Usage: laplace ["inverse"] variable

limit - Take the limit as variable goes to expression (experimental).
Usage: limit variable expression

list - Display equation spaces in single-line format.
Usage: list ["export" or "maxima" or "gnuplot" or "hexadecimal"] [equation-number-ranges]

nintegrate - Do numerical definite integration using Simpson's rule.
Usage: nintegrate ["trapezoid"] variable [partitions]

optimize - Split up equations into smaller, more efficient equations.
Usage: optimize [equation-number-range]
Related command: code

pause - Wait for user to press the Enter key. Optionally display a message.
Usage: pause [text]

plot - Automatically plot expression in 2D or 3D with Gnuplot.
Usage: plot [expression]

product - Compute the product as variable goes from start to end.
Usage: product variable start end [step-size]
Related command: sum

push - Push equation spaces into readline history for editing.
Usage: push [equation-number-range]

quit - Terminate this program without saving.
Usage: quit [exit-value]
Alternate name for this command: exit

read - Read in a text file as if it was typed in.
Usage: read file-name

real - Copy the real part of the current expression.
Usage: real [variable]
Related command: imaginary

replace - Substitute variables in the current equation with expressions.
Usage: replace [variables ["with" expression]]

roots - Display all the roots of a complex number.
Usage: roots root real-part imaginary-part
This command may be preceded with "repeat".

save - Save all equation spaces in a text file.
Usage: save file-name
Related command: read

set - Display, set, or save current session options.
Usage: set [["no"] option] ...
Tip: Type "set" by itself to show all current option settings.

simplify - Completely simplify expressions.
Usage: simplify ["sign"] ["symbolic"] ["quick"] ["quickest"] ["fraction"] [equation-number-range]
This command may be preceded with "repeat".

solve - Solve the current equation for a variable or for zero.
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Usage: solve ["verify"] ["for"] variable or "0"

sum - Compute the summation as variable goes from start to end.
Usage: sum variable start end [step-size]
Related command: product

tally - Prompt for and add entries, show total and optionally the average.
Usage: tally ["average"]

taylor - Compute the Taylor series expansion of the current expression.
Usage: taylor ["nosimplify"] variable order point

unfactor - Algebraically expand (multiply out) expressions.
Usage: unfactor ["fraction"] ["quick"] ["power"] [equation-number-range]
Alternate name for this command: expand

variables - Show all variable names used within the specified expressions.
Usage: variables ["c" or "java" or "integer"] [equation-number-range]
Related command: code

version - Display Mathomatic version and license information.
Usage: version

End of command list.  Total of 42 different commands.
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To enter an expression or equation, simply type it in at the prompt.
Operators have precedence decreasing as indicated:

    ! factorial (gamma function)
    ** or ^ power (exponentiation)
    * multiply      / divide        % modulus       // integral divide
    + add           - subtract
    = equate (lowest precedence)

Multiple operators of the same precedence level are grouped left to right.

Variables consist of any combination of letters, digits, and underscores (_).
Predefined variables follow:

    sign, sign1, sign2, ... - may only be +1 or -1
    integer, integer1, ... - may be any integer value

Absolute value notation "|x|" and dual polarity "+/-x" are understood.
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Constants are double precision floating point values with about
14 decimal digits accuracy.  They can be entered in standard, scientific,
or hexadecimal notation.  Excepting named constants, constants always
start with a decimal digit (0..9) or a period.

Named constants follow:

    e or e# - the universal constant e (2.7182818284...)
    pi or pi# - the universal constant pi (3.1415926535...)
    i or i# - the imaginary unit (square root of -1)
The above constants may also be used anywhere variables are required.
    inf - floating point infinity constant
    nan - invalid floating point result (not enterable)

The largest value of a constant is +/-1.79769e+308
The smallest value of a constant is +/-2.22507e-308
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