

Maple Quick Reference Card


Windows® version


Document Mode vs. Worksheet Mode

Maple offers two primary modes of problem entry and content creation: Document mode and Worksheet mode. Both modes have respective advantages and you can easily switch from one mode to the other for maximum flexibility.





Document Mode	Worksheet Mode
<ul style="list-style-type: none"> <input type="checkbox"/> Quick problem-solving and free-form, rich content composition <input type="checkbox"/> No prompt (>) displayed <input type="checkbox"/> Math is entered and displayed in 2-D <input type="checkbox"/> Press [Ctrl][=] to evaluate expression (inline results) <input type="checkbox"/> Press [Enter] to evaluate expression (results on new line) <input type="checkbox"/> Solve math problems with right-click menu on input and output <input type="checkbox"/> Switch to Worksheet mode by inserting prompt 	<ul style="list-style-type: none"> <input type="checkbox"/> Traditional Maple problem-solving environment <input type="checkbox"/> Enter problems at a prompt (>) <input type="checkbox"/> Math entered and displayed in 2-D or 1-D <input type="checkbox"/> Press [Enter] to evaluate expression <input type="checkbox"/> Solve math problems with right-click menu on output <input type="checkbox"/> Switch to Document mode by creating document block

<p>Document mode lets you create rich content. For example, the following solves for x without any commands:</p> $\frac{(x-2)}{\alpha} \xrightarrow{\text{solve for } x} [[x=2]]$	<p>> $\text{solve}\left(\frac{x-2}{\alpha}=1, x\right)$</p> <p style="text-align: right;">2 + alpha</p> <p>> solve((x-2)/alpha=1, x);</p> <p style="text-align: right;">2 + alpha</p>
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
Toggle Math/Text entry mode	[F5]  on toolbar	Toggle 2-D/1-D Math entry mode	[F5] 2-D black font, 1-D red font
Evaluate math expression and display result inline	[Ctrl] [=]	Evaluate math expression and display result on new line	[Enter]
Evaluate math expression and display result on new line	[Enter]	Continue on next line without executing	[Shift][Enter]

Switch to Worksheet mode (insert prompt)	 on toolbar	Switch to Document mode	Format → Create Document Block
Show hidden commands	View → Expand Document Block	Hide commands. Show only results.	Highlight commands to be hidden. Format → Create Document Block

Common Operations Available in Both Document and Worksheet Modes

Display quick help	[F1] for Quick Help. [Ctrl][F2] for Quick Reference Card (this guide)
Refer to previous result using equation numbers	[Ctrl][L] then enter equation number in dialog
Recompute calculations within a highlighted selection or chain of commands	 on toolbar
Recompute all calculations in a document	 on toolbar
Symbol selection, e.g. ϵ (epsilon)	Enter leading characters [Ctrl][Space], e.g. eps[Ctrl][Space]
Command completion, e.g. Lambert W function	Enter leading characters [Ctrl][Space], e.g. Lamb[Ctrl][Space]
Perform context operation on math expression	Right-click any math expression
Insert prompt	 on toolbar
Insert text paragraph	 on toolbar

2-D Math Editing Operations, Keyboard Shortcuts, and Operations ([Details](#))

Navigate through expression	[←][→][↑][↓]			
Move cursor to different level in expression, e.g. out of exponent	[→]			
Navigate through placeholders	[Tab]			
Add, remove, rearrange palettes	View → Palettes → Arrange Palettes or right-click palette			
Fraction $\frac{x}{y}$, superscript x^n , subscript x_n	x/y, x^n, x_n			
Prime notation for derivatives, e.g. $y'' + y' = 0$ for $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$	y'' + y' = 0			
Square root \sqrt{x} , n th root $\sqrt[n]{x}$	Enter leading characters sqrt [Ctrl][Space], nthroot [Ctrl][Space]			
Symbol above, e.g. \vec{x}	x [Ctrl][Shift]["] then insert symbol, e.g.  from Arrows palette			
To enter literal characters ($_$, $^$, etc.), precede character with \ (backslash)	e.g. foo_bar produces foo_bar			
Greek letter entry mode (single letter)	[Ctrl][Shift][G] letter			
Special characters and symbols: Enter leading characters and [Ctrl][Space]	π, e, i	pi, e, i	α, λ	alpha, lambda
	∞	infin	\geq, \leq, \neq, \pm	geq, leq, ne, pm

Plotting and Animation

Plot an existing expression	Right-click expression → Plots → Plot Builder
Plot new expression	Tools → Assistants → Plot Builder
Add new expression to existing plot	Highlight and drag expression into plot
Animation and parameter plots for functions of several variables	Right-click expression → Plots → Plot Builder and select a plot type

Mathematical Operations

Common manipulations (simplify, factor, expand,...)	Right-click expression and select from menu
Solve equations	Right-click equation → Solve
Solve numerically (floating-point)	Right-click equation → Solve Numerically
Solve ODE	Right-click DE expression → Solve DE Interactively
Integrate, differentiate	Right-click expression → select Integrate or Differentiate
Evaluate expression at a point	Right-click expression → Evaluate at a Point
Create a matrix or vector	Matrix palette → Choose → Insert
Invert, transpose, solve matrix	Right-click matrix → Standard operations → select Inverse , Transpose , ...
Evaluate as floating-point	Right-click expression → Approximate
Various operations and tasks	Use Task Templates: Tools → Tasks → Browse

Important Maple Syntax

<code>:=</code> Assignment	<code>a := 2; b := 3 + x; c := a + b;</code> produces $5+x$ for <code>c</code>
<code>=</code> Mathematical equation	<code>solve(2*x + a = 1, x);</code> produces $x = \frac{1-a}{2}$
<code>=</code> Boolean equality	<code>if a = 0 then ...</code>
Suppress display of output	Terminate command with a colon, e.g. <code>1000! :</code>
Display help on topic	<code>?topic</code>

Expressions vs. Functions

Operations	Expression x^2+y^2	Function (operator) $g(x,y) = x^2 + y^2$
Definition	<code>f := x^2 + y^2;</code>	<code>g := (x,y) -> x^2+y^2;</code>
Evaluate at $x=1, y=2$	<code>eval(f, [x=1,y=2]);</code> produces 5	<code>g(1,2);</code> produces 5
3-D plot for x from 0 to 1, y from 0 to 1	<code>plot3d(f, x=0..1, y=0..1);</code>	<code>plot3d(g(x,y), x=0..1, y=0..1);</code>
Conversion to other form	<code>f2 := unapply(f, x, y); f2(1,2);</code> produces 5	<code>g2 := g(x,1); g2 + z;</code> produces x^2+1+z


Units and Tolerances ([Units Details](#))

Add units to value or expression	Place cursor to right of quantity. Use Units (SI) or Units (FPS) palette or right-click → Units → Affix Unit .
Add arbitrary unit	<code>[[unit]]</code> from Units (SI) or Units (FPS) palette and enter desired unit
Simplify units in an expression	Right-click expression → Units → Simplify

Convert units to a different system of units	Right-click expression → Units → Convert
Enable automatic units simplification	with (Units) [Standard] ;
Enable tolerance calculations	with (Tolerances) ;
Tolerance quantity in 2-D Math	9 pm [Ctrl][Space] 1.1 for 9 ± 1.1
Tolerance quantity in 1-D Math	9 &+- 1.1; for 9 ± 1.1

Input and Output

Select Interactive Tools and Utilities

Quick introductory tour	Help → Take a Tour of Maple
Show available task templates	Tools → Tasks → Browse
Interactive Dictionary of Engineering and Mathematical terms	Help → Manuals, Dictionary , and more → Dictionary
Plot Builder	Right-click expression → Plots → Plot Builder , or Tools → Assistants → Plot Builder
ODE Analyzer	Tools → Assistants → ODE Analyzer
Data Analysis Assistant	Tools → Assistants → Data Analysis
Unit Conversion utility	Tools → Assistants → Units Calculator
Manuals (Getting Started Guide, User Manual)	Help → Manuals, Dictionary, and more → Manuals
Graphing Calculator Interface	Installs as separate program. Launch from  Maple Calculator Calculator icon on desktop.
Interactive education tutors for topics in Calculus, Precalculus, and Linear Algebra	Tools → Tutors

