desmos

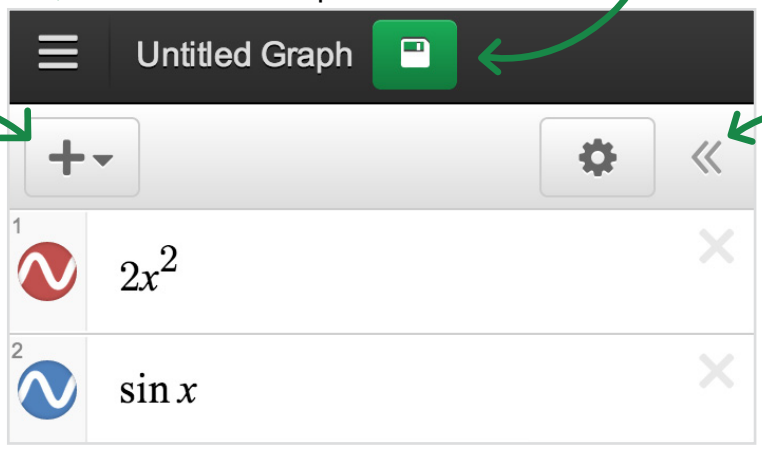
User Guide

Learn more about graphing functions, plotting tables of data, evaluating equations, exploring transformations, and more! If you have questions that aren't answered in here, send us an email at calculator@desmos.com.

Getting Started with Desmos

Making a graph

Welcome to Desmos!! To create a new graph, just type your expression in the expression list bar. As you are typing your expression, the calculator will immediately draw your graph on the graph paper.



Open Graph
Revisit your saved graphs and example graphs here.

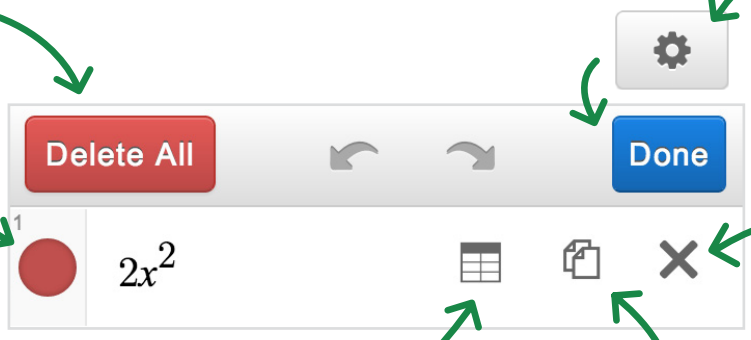
Save As or Rename
Click here to save a copy of your graph or rename it. You can also press ctrl+shift+s.

Save
Click here to save your graph or press ctrl+s.

Add Item
Add a new expression, table, text box, folder, or image.

Hide list
Push your expressions list to the side to give full attention to your graph.

Hide
Click here to hide individual expressions.



Delete all
Delete all of your expressions here.

Edit List
Delete, duplicate, change color, or convert to table.

Change color
Choose a new color for the expression.

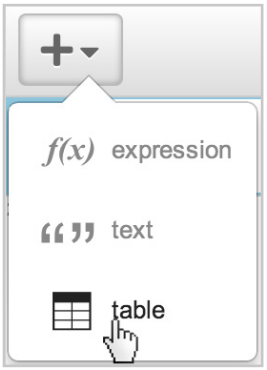
Delete
Click here to remove your expression.

Convert to table
Generate a table from the expression.

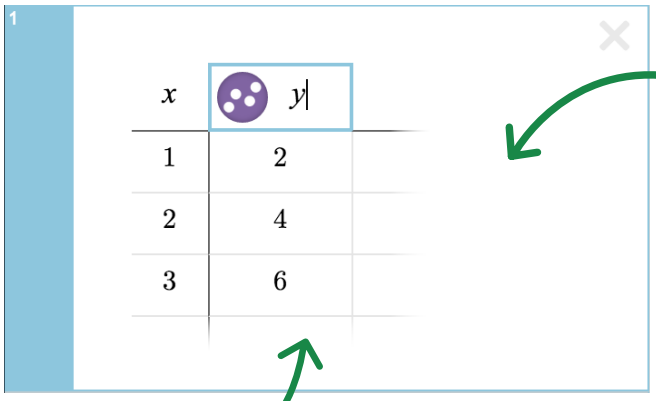
Duplicate
Add a copy of the expression below the current one.

Tables

Dive deeper into data with tables! You can create a new table or convert an existing expression into a table. If your existing expression includes sliders, they will remain functional after the expression is converted into a table.

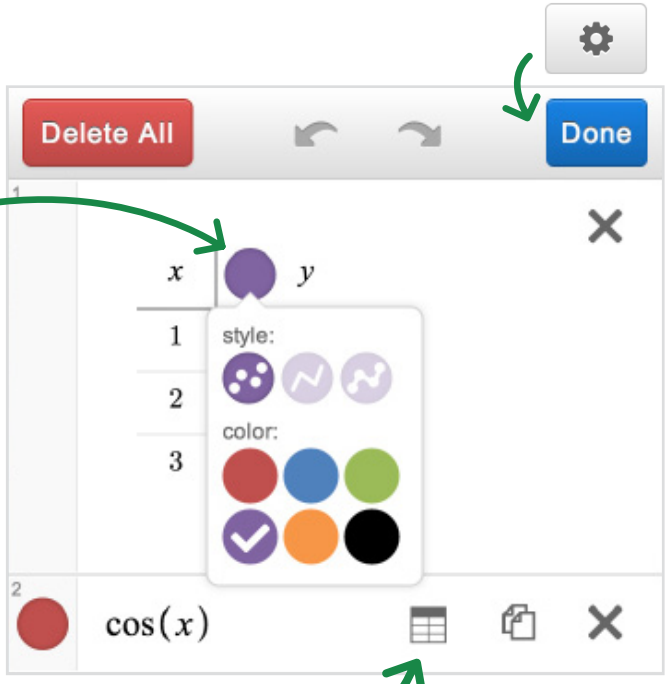


Add Table
Click the "Add Item" button to create a new table.



Add Column
Make a new column by hitting the right arrow key or clicking in the top cell of the column.

Add Row
Make a new row by hitting the down arrow key or clicking in the cell.



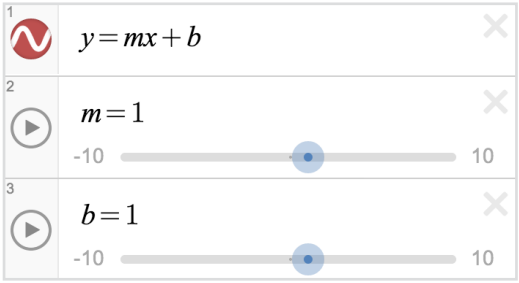
Options Menu
Click the icon to change color, connect or hide the points, or insert a new column.

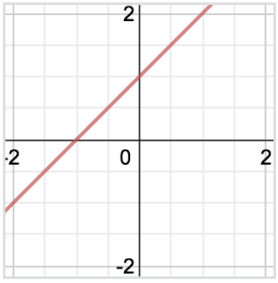
Convert to Table
In edit mode, click the "convert to table" icon to create a table from your expression.

Variables and Sliders

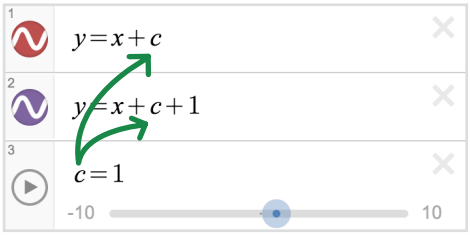
You can graph a single line by entering an expression like y = 2x + 3. To make the graph more dynamic, you can use parameters instead of constants: for example, y = mx + b. Add sliders for the undefined parameters by clicking the prompt or define the parameters yourself by entering m=2 and b=3. When you give constant values to parameters like m and b, the calculator will automatically allow you to adjust their values with sliders. Adjusting m with the slider changes the slope of the line, and adjusting b with the slider changes the intercept.

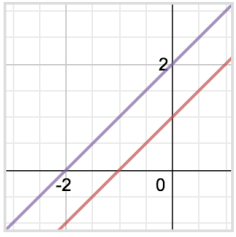
Any time you have free variables in an expression, the calculator will offer to let you define them with sliders:



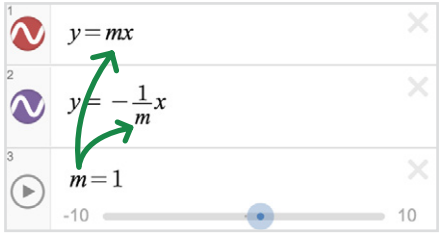


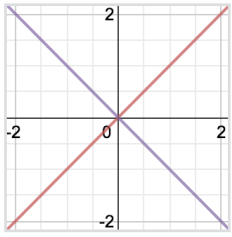
You can use the same variables in several expressions to plot curves that will change together. For example:





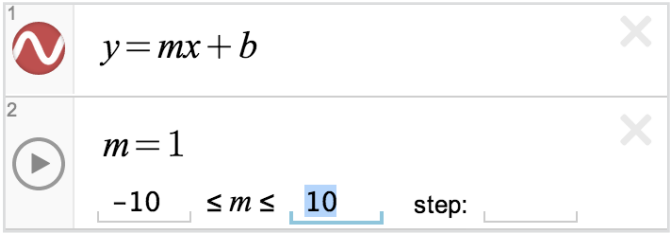
The value of c defines two parallel lines that move up and down together.





These two lines stay perpendicular to each other for any value of m.

To adjust the limits and interval of your slider, click either of the values at the ends of the slider bar. Input your desired values and click the expression or the graph to complete the adjustment.



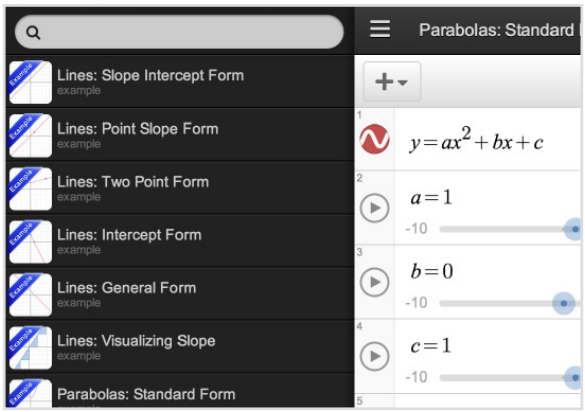
To create a movable point, enter a point with a variable for at least one coordinate. Click and drag the point around the graph to change the value of the parameter(s). To make graphs more interactive, use parameters from your movable point in your expressions. For example, you can graph the line y-b=m(x-a) and plot the movable point (a,b) to see the line move when you drag the point - don't forget to add sliders!

Saving a graph

You will need to be signed in to save and open your graphs.

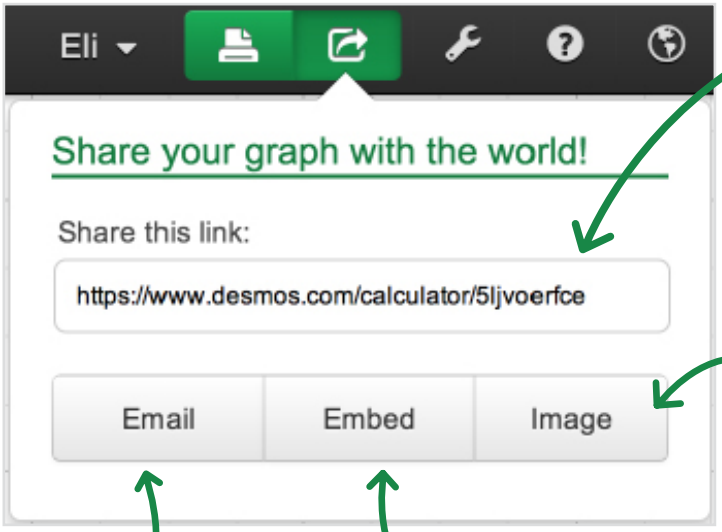
Save a graph by pressing the button located to the right of the title bar or pressing ctrl+s on your keyboard.

Access your saved graphs by clicking the my graphs icon: ☰



Sharing a graph

Clicking in the top toolbar will allow you to share your graphs.



Permalink
Underneath the social sharing options, you will see a permalink for your graph. You can copy this link and share it with anyone. When they open it, they will see your graph and all of the equations.

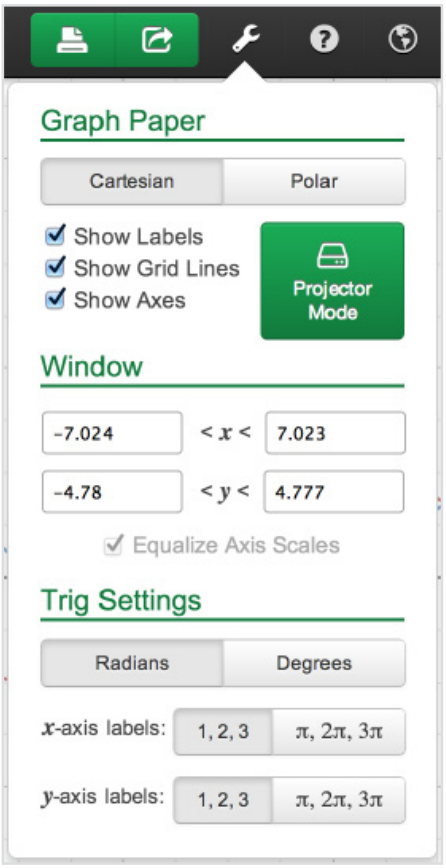
Image
Grab a screenshot of your graph by clicking the Image button. An image of your graph will open in a new window, which you can print or right-click to save as an image.

Email
Email your graph by clicking here. You can send to multiple recipients and even add a custom message.

Embed
Copy the HTML embed code to post your graph in a website or wiki. You can also use the BBCode for your graph to share in any of our partner forums.

Settings, Zoom, and Language

Settings



Graph Paper

In the graph paper section you can choose between Cartesian and Polar grids, show or hide labels, grid lines, and axes by checking or unchecking these boxes.

Using projector mode will make the graph and axes lines thicker, and the number labels larger. This is great for students sitting in the back of the classroom who are looking at Desmos on the projector.

Window

Adjust the scale of your axes here to change the view of your graph.

Trig Settings

Choose between regular labels or π labels, and radian versus degree mode here.

Zoom

You may zoom in and out of the calculator by using the zoom buttons in the top right corner of the graph space. To return to the default view, click the home button.

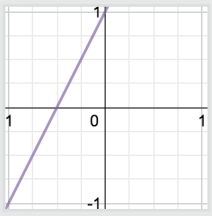
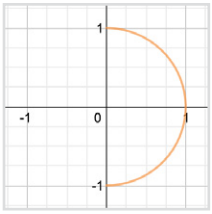
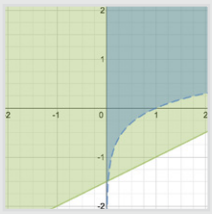
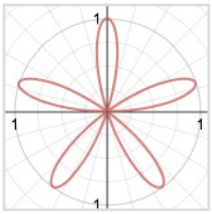
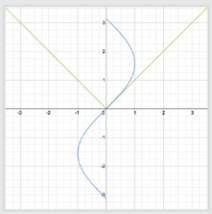
Other ways to zoom:

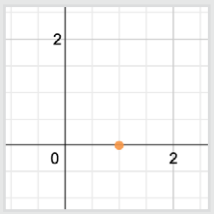
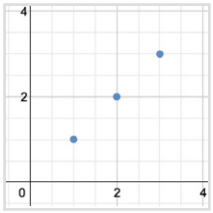
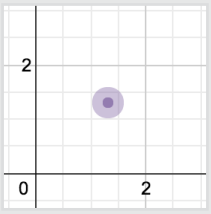
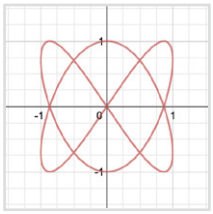
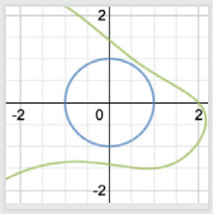
If you are using a touch-enabled device, you may also use the pinch and zoom technique within the graphing space. While using a computer with a mouse, you can use the scroll wheel for zooming. Click and drag within the graphing window to pan your graph within the graphing space.

Language

To change the language of the calculator interface, click the icon and select your language from the list. If you don't see your language and would like to help with translation, email us at translations@desmos.com.

Graphable Expressions

Type of Graph	Example	Notes	
Regular function	$y=2x+1$		
x in terms of y	$x=\sqrt{(1-y^2)}$		
Inequalities	$y>\log(x)$ $x\leq 2y+3$	Strict inequalities are plotted with dashed lines	
Polar	$r=\sin(5\theta)$	Expressions with r and theta (θ) will be interpreted as polar	
Piecewise	$y=\lvert x\rvert\{x<0\}$ $x=\sin(y)\{-\pi<y<\pi\}$	Limit the domain or range of your expressions using piecewise notation	

Type of Graph	Example	Notes	
Point	(1,0)	Use parentheses to plot points	
Point List	(1,1), (2,2), (3,3)	You can plot several points by separating them with commas	
Movable Point	(a,b)	Use a parameter for at least one coordinate	
Parametric	(sin(2t), cos(3t))	Parametric equations have the same form as points. Any point with functions of t for coordinates will be plotted as a parametric equation	
Implicit	$x^2+y^2=1$ $y^2+\sin(x)y+x=2$	Implicit equations can only be graphed if they are quadratic in x and/ or y	

Supported Functions

Exponents & Logs

exp(x)

ln(x)

log(x)

$\log_n(x)$

x^n

Trig Functions

sin(x)

cos(x)

tan(x)

sec(x)

csc(x)

cot(x)

Inverse Trig Functions

arcsin(x)

arccos(x)

arctan(x)

arcsec(x)

arcscs(x)

arccot(x)

Hyperbolic Trig Functions

sinh(x)

cosh(x)

tanh(x)

sech(x)

csch(x)

coth(x)

Stats & Probability

ceil(x)

floor(x)

round(x)

abs(x)

min(a,b)

max(a,b)

lcm(a,b)

gcd(a,b)

nCr(n,r)

nPr(n,r)

! (factorial)

Precalc & Calculus

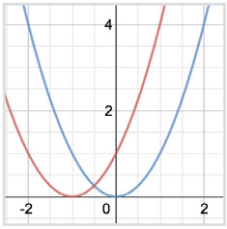
d/dx

∑

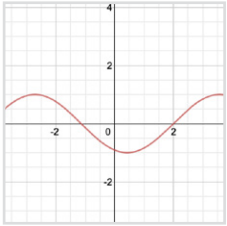
Π

Define your own function

You can also create your own functions, which can be defined with any letter (except for the special ones, like x,y,r, t, and e). Your custom functions can then be used like any other function on this list. For example, if you type f(x) = x^2, you can then graph y = f(x+1), which is the same parabola but shifted over to the left:



You can even define functions that take more than one argument. For example, you can enter: g(a,b) = sin(a-b). This won't graph, but you could then graph something like y = g(x,2):



Keyboard Shortcuts

Open Graph: ctrl + o

Save: ctrl + s

Save-As or Rename: ctrl + shift + s

Undo: ctrl + z

Redo: ctrl + y

New expression: Press “enter”

Move up/down: Press the ↑ and ↓ arrow keys

Move left/right: Press the ← and → arrow keys

Add a new text box: Press the quotation keys (“ ”)

Delete an expression: Press “delete”

Symbols

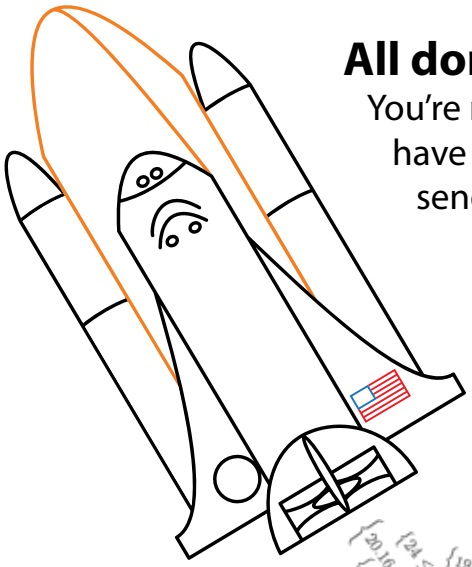
∑ : Type “sum”

π : Type “pi”

θ : Type “theta”

√ : Type “sqrt”

∏ : Type “prod”



All done!

You’re ready to take off and explore Desmos! If you have questions that we didn’t answer in here, send us an email at calculator@desmos.com.