

Graphing with ODT Calc

We are going to use the Open Office Spreadsheet program **Calc** to graph trigonometric functions. We will create a table of values and then use the "Chart" feature to draw the graph.

Open Calc.

In cell A1 enter the heading "x" and in cell B1 enter "sin(x)".

We will create a column of x-values from -10 to 10 increasing by 1.

Save time by using the Fill Series option—enter -10 in cell A2 and fill down using the Linear type with an increment of 1.

	A	B	C	D
1	x	sin(x)		
2	-10			
3	-9			
4	-8			
5	-7			
6	-6			
7	-5			
8	-4			
9	-3			
10	-2			
11	-1			
12	0			
13	1			
14	2			
15	3			

In cell B2 enter the formula "=sin(A2)". Drag the formula down. If the program asks what type of fill, select "Formulas".

Now you should have two columns of data. The x-values from -10 to 10 and the corresponding values for the sin(x).

	A	B	C
1	x	sin(x)	
2	-10	0.54	
3	-9	-0.41	
4	-8	-0.99	
5	-7	-0.66	
6	-6	0.28	
7	-5	0.96	
8	-4	0.76	
9	-3	0.14	
10	-2	0.91	
11	-1	0.84	
12	0	0	
13	1	0.84	
14	2	0.91	
15	3	0.14	

Notice the formula bar near the top of the window. Arrow down through the sin(x) values and see how Calc changed the cell references for each row.

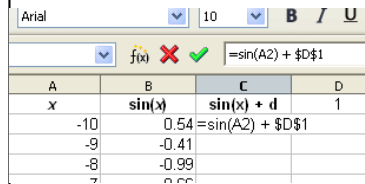
B	C	D
sin(x)		
0.54		

← The formula bar

Sometimes we don't want this updating of cell references to occur.

In cell D1 enter "1"

In cell C2, enter, " $=\sin(A2) + \$D\1 ".



A	B	C	D
x	sin(x)	sin(x) + d	1
-10	0.54	=sin(A2) + \$D\$1	1
-9	-0.41		
-8	-0.99		
-7	0.54		

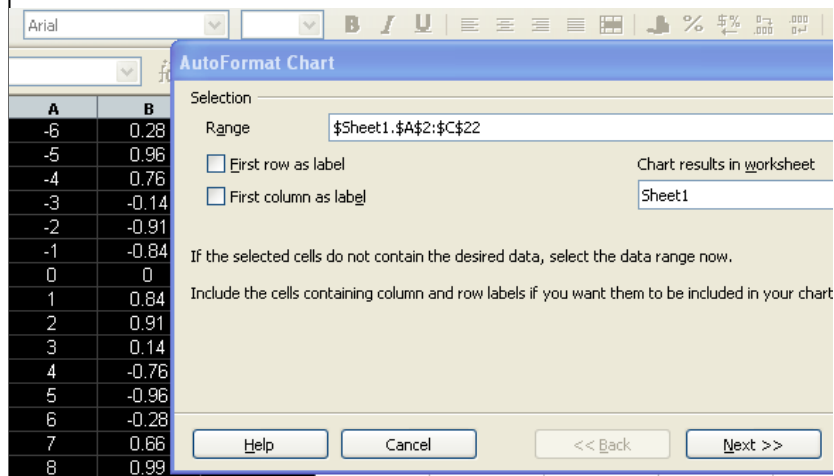
Fill down. Notice the "\$" prevents the cell reference to D1 from changing as the formula is filled down, so each cell contains the value " $\sin(x) + 1$ ".

	A	B	C	D
	x	sin(x)	sin(x) + d	1
	-10	0.54	1.54	
	-9	-0.41	0.59	
	-8	-0.99	0.01	
	-7	-0.66	0.34	
	-6	0.28	1.28	
	-5	0.96	1.96	
	-4	0.76	1.76	
	-3	-0.14	0.86	
	-2	-0.91	0.09	
	-1	-0.84	0.16	
	0	0	1	
	1	0.84	1.84	
	2	0.91	1.91	

Starting with cell A2, highlight the three columns of data.

Select "Insert" -> "Chart"

Click "Next >>"



AutoFormat Chart

Selection

Range: \$Sheet1.\$A\$2:\$C\$22

First row as label

First column as label

Chart results in worksheet: Sheet1

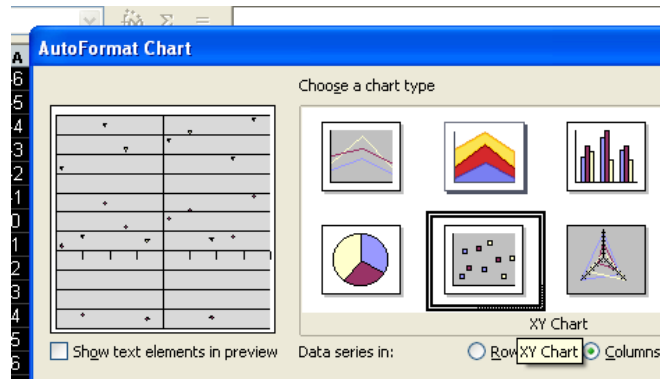
If the selected cells do not contain the desired data, select the data range now.

Include the cells containing column and row labels if you want them to be included in your chart

Buttons: Help, Cancel, << Back, Next >>

Under "Choose a chart type" select "XY Chart".

Click "Next >>".

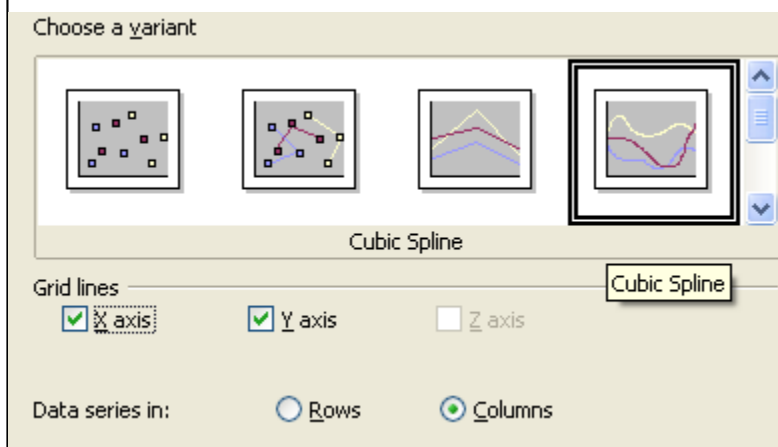


Under "Choose a variant" select "Cubic Spline". This option tells Calc to draw a smooth curve through all our data points. (A common mistake when graphing by point-plotting is to draw a straight line between the points).

Under "Grid lines", click the box for "X axis".

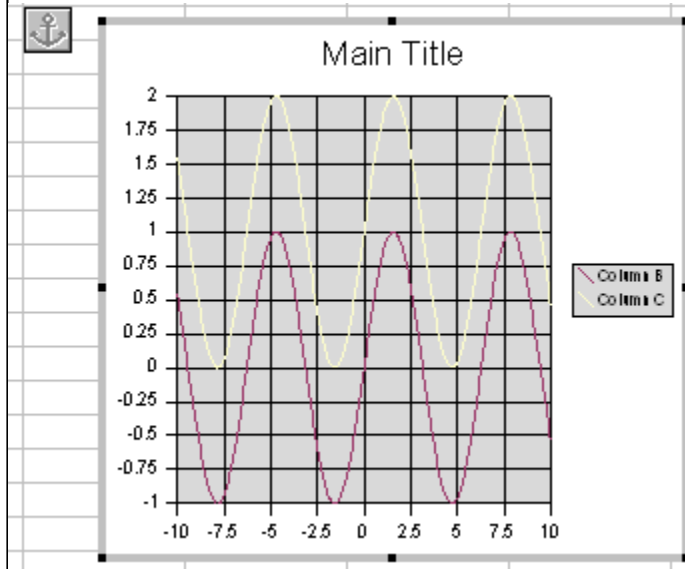
Make sure "Columns" is selected, since our data is in columns.

Click "Create"

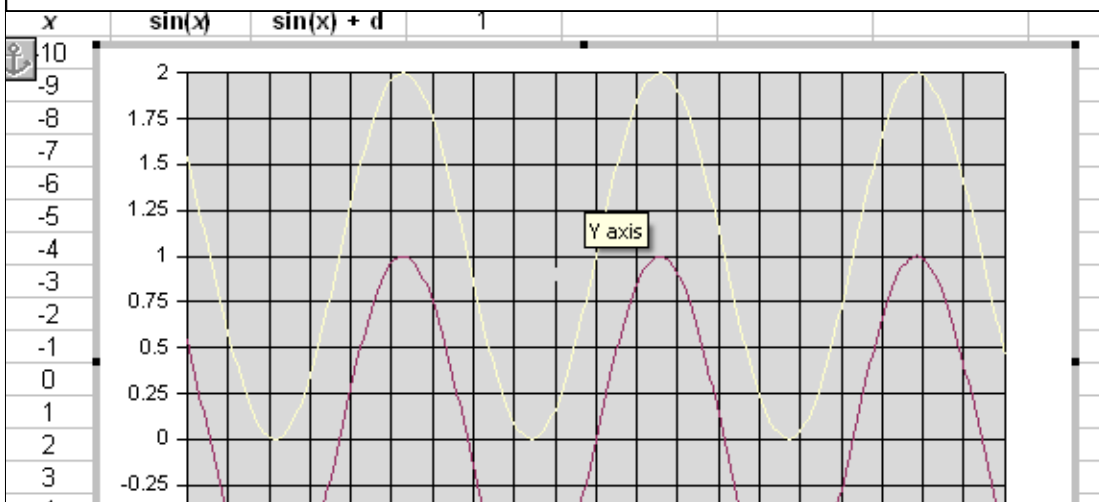


You should see a chart similar to this. The chart is small and squished together. Use the pointer to grab the corners and stretch it out to a large size.

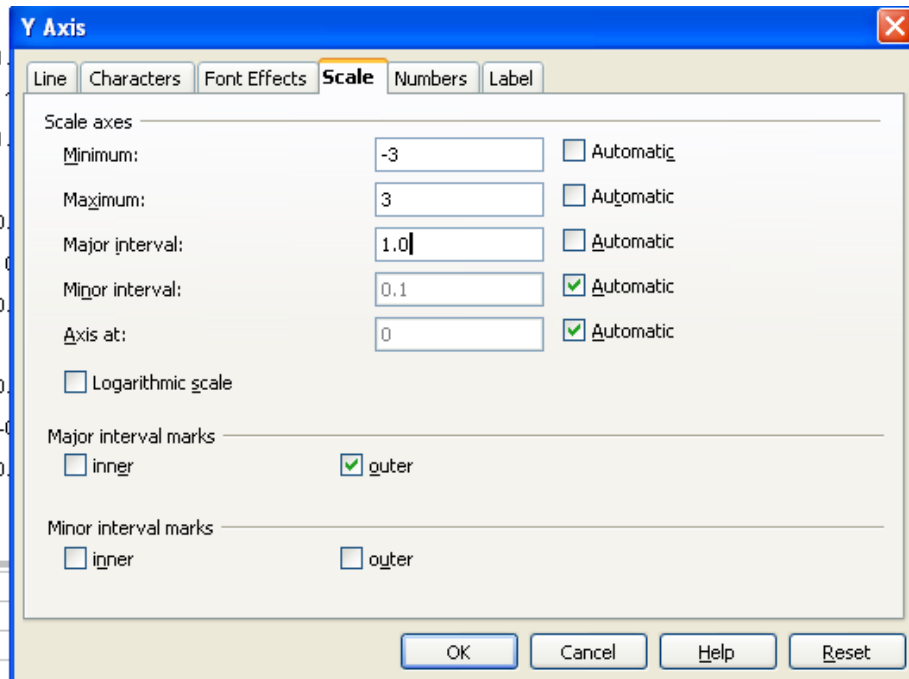
If you want an even larger graph, click on the title and legend box and delete them.



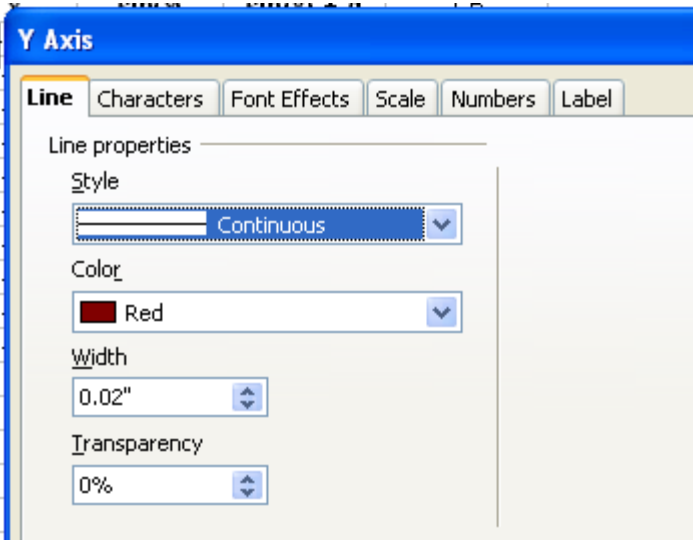
Double click on the chart so that it is surrounded by a grey line. Place the pointer over the y-axis so that a box appears that says "Y axis".



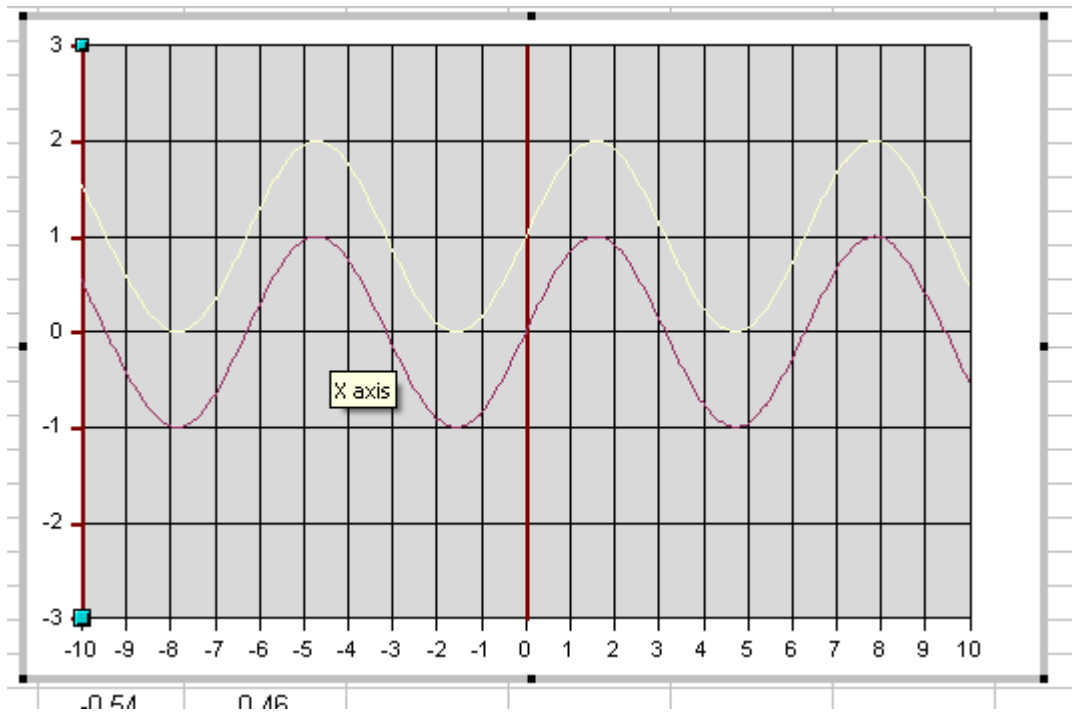
- Double click the Y-axis. This will bring up a box that allows us to change features of the Y-axis.
- Ensure you are on the **Scale** tab.
- Change the minimum y-value to -3 (deselect Automatic)
- Change the maximum y-value to 3
- Change Major Interval to 1
- Ensure "outer" is selected under "Major interval marks"
- Click the **Line** tab.



On the **Line** tab change the color of the Y-axis to red and increase the thickness to 0.02"
Click "OK"



Below is our current graph.
Place the pointer over the X axis.
Double click to select the X axis.



- Ensure the **Scale** tab is selected.

We are graphing trigonometric functions so it is convenient to have the x -axis marked off in multiples of π (approx 3.1).

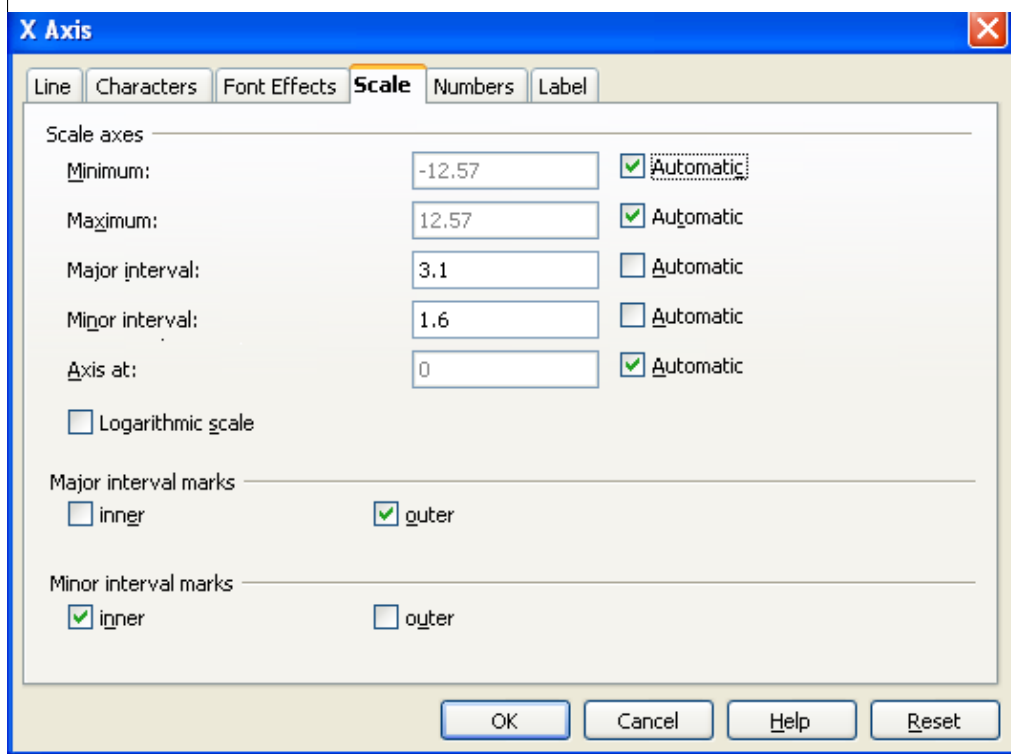
- Set "Major interval" to 3.1

- Set "Minor interval" to 1.6 (This is approx. $\pi/2$)

- Set "Minor interval marks" to "inner"

- Goto the **Line** tab and change the color and thickness of the x -axis, same as y -axis

- Click "OK"



Here is our Graph!!!

If you want to change the color or style of the curves you can double click them. Try it out!

The graphs pictured are $y = \sin(x)$ and $y = \sin(x) + 1$.

Suppose we want to see $y = \sin(x) + 2$ Just go to cell D1 and change the "1" into a "2".
Watch what happens! Try changing the value in D1 to some other values.

