

## 3D graphing (Tutorial B8)

[http://www.atomiclearning.com/k12/en/movie/85852/play\\_window?type=Tutorial&sid=2410](http://www.atomiclearning.com/k12/en/movie/85852/play_window?type=Tutorial&sid=2410)

[00:00:00.00]

To graph a function in 3D, I'll start by pressing the Home key, and then choosing Graphs to insert the Graphs application

[00:00:07.00]

into a new page. I'll then press the Menu key, choose View, and then 3D Graphing. Next we can enter our expression

[00:00:21.00]

in the entry line at the bottom. My expression is  $x^2+5x+4$ . So I'll enter "x," then press the " $x^2$ " key, and then

[00:00:33.00]

enter "+5x+4." To plot this graph, I'll press the Enter key on the keypad. Once the graph is displayed in 3D, I

[00:00:46.00]

can rotate the graph manually by pressing any of the four Arrow keys to rotate the graph. To automatically rotate

[00:00:53.00]

the graph, I can press the "a" key on the keypad to start the auto rotation. To stop the rotation, I can press the

[00:01:01.00]

Esc key. I have the choice to view the graph from a specific orientation. I can use the letter keys to select the orientation.

[00:01:10.00]

For example, I'll press the "x" key, to view along the x-axis. And I can press the "y" key to view along the y-

[00:01:18.00]

axis. At any time, I can always press "o" on the keypad to view the graph from the default orientation. To shrink

[00:01:26.00]

or magnify the 3D view, we can press the multiplication key to magnify the view, and the division key, to shrink

[00:01:35.00]

the view. We can customize our 3D viewing environment. To set the background color, with our pointer over the background,

[00:01:45.00]

we'll display the context menu for the work area by pressing Control, and then the Menu key. From the menu, we can select

[00:01:53.00]

Background Color. Next, we can use the pointer to hover over one of the color squares, and press the Click key

[00:02:01.00]

to select the background color. For my example I'll select orange, and we can see our new background color. We can

[00:02:09.00]

also choose a line color for the box and axes as well. I'll move the pointer over one of the lines of the box until

[00:02:16.00]

the box becomes highlighted, and then press Control, followed by the Menu key. I'll then choose Color, followed by Line

[00:02:26.00]

Color. I'll choose blue by moving my pointer over it, and pressing the Click key to select that color. Then I'll

[00:02:35.00]

move the pointer off the box, and press the Click key, to view our new line color. To see my graph a little easier,

[00:02:42.00]

I'll also change the surface plot color. I'll move the pointer over my graph, then press Control, followed by

[00:02:51.00]

Menu, choose Color, Custom Plot Color. In the dialog box that opens up, with the top radio button selected, I can

[00:03:02.00]

set a top and bottom surface color. I'll change the top color first by using the Tab key to highlight the top color

[00:03:09.00]

square, and then pressing the Click key to bring up the color squares. I'll move the pointer over green, and press

[00:03:18.00]

the Click key to select it. Now I'll press Tab to move to the Bottom color, then using the Touchpad to highlight

[00:03:27.00]

and select red. I can then press the Tab key to highlight the Ok button, and press Enter to close the dialog box.

[00:03:36.00]

We can now see our new surface colors. To start tracing in 3D view, we can press the Menu key, choose Trace, and

[00:03:47.00]

then z Trace. The z Trace icon appears in the upper left corner, and the trace plane appears, along with a text

[00:03:55.00]

line showing the current "z=" trace value. I can move the trace by pressing and holding down the Shift key, and then

[00:04:03.00]

pressing the up or down arrow key. The "z=" text line is updated as I move the trace plane. I'll press Escape to

[00:04:14.00]

move out of the z-trace. You can also graph parametric curves in a 3D coordinate system to create different surfaces

[00:04:22.00]

like spirals and spheres. To graph using 3D parametric equations, while we're in 3D Graphing view, press Menu,

[00:04:30.00]

then 3D Graph Entry/Edit, and choose Parametric. Now you can type equations into the appropriate spaces. I'll graph

[00:04:41.00]

an open cylinder. For x, I'll enter 2 times the sine of t. To move to my y, I'll use the down arrow key, and then

# TI-Nspire™ Handheld Script

[00:04:53.00]

I'll type 2 times the cosine of t, and then press the down arrow key again. For my z parameter, I'll type u. To graph

[00:05:04.00]

the cylinder, I'll press the Enter key. Now I can analyze and explore my graphs. I'll press the y key to view the

[00:05:13.00]

intersection along the y-axis.

[00:05:17.00]