

## 3D graphing (Tutorial B8)

[http://www.atomiclearning.com/k12/en/movie/86410/play\\_window?type=Tutorial&sid=2421](http://www.atomiclearning.com/k12/en/movie/86410/play_window?type=Tutorial&sid=2421)

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To graph a function in 3D, I'll insert the Graphs application into a new page by clicking Insert, and then choosing Graphs.

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In the Document Tools, I'll click on View, then choose 3D Graphing. Next we can enter our expression in the entry

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line at the bottom. My expression is  $x^2+5x+4$ . So I'll type "x," then Shift 6, then 2, then the right arrow key

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to move out of the exponent, and then "+5x+4." To plot this graph, I'll press the Enter key on the keyboard. Once

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the graph is displayed in 3D, I can rotate the graph manually by pressing any of the four arrow keys to rotate the graph.

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To automatically rotate the graph, I can press "a" on the keyboard to start the auto rotation. To stop the rotation,

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

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keys to select the orientation. For example, I'll press the "x" key, to view along the x axis. And I can press

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the "y" key to view along the y axis. At any time, I can always press "o" to view the graph from the default orientation.

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

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

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we'll display the context menu for the work area by right clicking on our mouse. From the menu, we can select Background

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Color. Next, we can use the pointer to hover over one of the color squares, and click to select the background color.

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For my example I'll click and select orange, and we can see our new background color. We can also choose a line

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color for the box and axes as well. I'll move the pointer over one of the lines of the box until the box becomes

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highlighted, and then right click on our mouse. I'll then choose Color, followed by Line Color. I'll choose blue

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by moving my pointer over that color square, and clicking to select it. Then I'll move the pointer off the box, and

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click anywhere on the background, to view our new line color. To see my graph a little easier, I'll also change

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the surface plot color. I'll move the pointer over my graph, then right click, choose Color, Custom Plot Color. In the

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dialog box that opens up, with the top radio button selected, I can set a top and bottom surface color. I'll change the

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top color first by clicking on the top color square, moving the pointer over the green color square, and clicking to

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select it. Next, I'll click the second color square, and click to choose red. Now I'll click OK to close the dialog

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box. We can then see our new surface colors. To start tracing in 3D view, in the Document Tools, we can click on Trace,

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

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

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

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

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

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Tools click 3D Graph Entry/Edit, and choose Parametric. Now you can type expressions into the appropriate spaces.

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I'll graph 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

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

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type u. To graph the cylinder, I'll press the Enter or Return key on the keyboard. Now I can analyze and explore



# TI-Nspire™ Software Script

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my graphs. I'll press the y key to view the intersection  
along the y-axis.

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