

# Basic Graphing on the TI-83/84

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## Entering an Equation

Equations are entered into the calculator by first pressing the **Y=** key just below the screen. Then simply enter the equations as you see them. To graph the equation, press the **GRAPH** key, which is also just under the screen.

## Changing the Viewing Window

If you have entered and graphed an equation, such as  $y = x^3 + 7x^2 + 4x$ , part of the graph may run off the screen. To change the size of the viewing window, press the **WINDOW** key. The calculator now asks you for the smallest and largest values of x and y that will show up on the screen. If  $xMin = -10$ ,  $xMax = 10$ ,  $yMin = -10$ , and  $yMax = 10$ , the graph runs off both the top and bottom of the screen. To view the complete graph, try changing the value to  $yMax = 20$ . If this does not give you a nice picture, guess again. You are also asked for  $Xscl$  and  $Yscl$ . These settings control the tick marks that are along the x and y axis. Finding the correct viewing window is a matter of practice and guessing. The more experience you have, the easier it will be. However, the **ZOOM** menu offers some help.  $xres$  is the graphing resolution. This can be set to any value from 1 to 10, the default is 2 which means that the graph will plot a point every 2 pixels.

## Zooming

Pressing **ZOOM** will present a menu of 10 options. This page will discuss what I consider the most useful of the **ZOOM** options. Refer you to your manual or your instructor for help with the other options.

**1:ZBOX** allows you to draw a box around a selected portion of a graph and enlarge the portion of the graph inside the box. To use this option, select **[1:ZBOX]**, use your cursor keys to move your cursor to one corner of the box you want to draw, press **ENTER**, move your cursor to the diagonally opposite corner of the box, and press **ENTER** again.

**2:Zoom In/3:Zoom Out** allows you to will change Min and Max of x and y by a factor of 4 (Zoom out multiplies each by 4, Zoom In divides each by 4.) Also it allows you to pick what the center of the window will be. If you select **[2:Zoom In]**, you get a cursor in the middle of the screen that you may move around with the arrow keys. When you press **ENTER**, that point becomes the center of the screen and the min and max values are adjusted accordingly.

**5:ZSquare** changes only one of the values so that the x-axis and y-axis have the same scale. A nice way to think about it is that this command will make the graph of a circle look like a circle.

**6:ZStandard** is a quick way to return your screen to the standard viewing rectangle,  $xMin = -10$ ,  $xMax = 10$ ,  $yMin = -10$ , and  $yMax = 10$ .

**0:ZFit** instructs the calculator to change only the  $yMin$  and  $yMax$  part of the viewing rectangle, not the x part. In doing so, the calculator will attempt to adjust the y values so that all maximums and minimums over the x interval are shown in the graphing window.

## The equation switch

If you have several equations in the calculator and you don't want all of them to be graphed, you can switch them on and off. In the **Y=** editor notice that once you have entered an equation the = sign becomes highlighted. You can move the cursor over the = sign and press **ENTER** to turn "off" the equation. When you press **GRAPH** the calculator will only graph the equations that have highlighted = signs.

## Tracing a Graph

Once an equation has been graphed, you can trace along the graph by pressing the **TRACE** key under the window. Pressing the left and right arrow keys moves you along the graph while displaying both the x and y coordinates.