3. RANGE SETTINGS

The most difficult aspect of graphing for most students is setting an appropriate viewing window.

The calculator has several built-in default settings for range variables. These are described on page 4-22 of the manual. The one most often used by students is ZSTD which sets the x and y ranges [-10,10] with tic marks at integer values of x and y. Sometimes this is sufficient but students should learn to choose range variables which give a viewing window which displays all of the interesting features of a graph (sometimes, but not often, this is impossible), or to clearly display one particular feature.

A useful default setting is ZDECM. This sets the range variables [-6.3,6.3,1] for x and [-3.1,3.1,1] for y. With these settings, the cursor moves in increments of .1 in both the x and y directions and every lattice point with integer coordinates is on a pixel. In most texts, the "interesting" points on a graph often have x-coordinates which are integers. In illustrating these, it is nice to have those integer values be cursor positions.

The default setting of ZDECM (especially those for the y-axis) may not be sufficient to display enough of a particular graph. However, multiplying the range settings by 10/n (n a positive integer) will still provide a viewing window so that there is a pixel at every integral lattice point. If one multiplies by 2, for example, the cursor will move in increments of .2 but will still land on every integer. Usually, this is more important for the x-axis than for the y-axis. Also, you can translate the settings by an integral value. For example the settings [-15.75, 15.75] (defaults x 10/4) for the x-axis give pixels at each integral value of x, as does [-5.75, 25.75] (translated by 10).

Trying to select range settings which give pixels at points with integer coordinates is a lot of trouble. In Section 25, there is a program which lets you choose a viewing window without worrying about this. You can then run the program and it will adjust the range settings slightly so that the resulting window has pixels at points with integer coordinates.

More often than not, none of the default settings will provide a good viewing window. The settings must be set manually. Sometimes, you can get an adequate viewing window by starting with a default window and zooming.

If one of the x,y ranges is large, you should change the x(y)Scl setting to prevent the tic marks from "cluttering up" the axis. For xScl=0 there are no tic marks.