

# Users Manual

**Eclipse FX PowerSet**  
Version 1.0

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## **Documentation**

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## **Introduction**

GraFX is a graphing package for Newton compatible devices using the Eclipse FX PowerSet.

Features include:

- Graphing of functions & polynomials
- Large graph display area
- Fast, real-time graphing
- True point cursor
- Zoom capability
- Maximum/minimum values of function

## **Installation**

To use GraFX, the Eclipse FX Calculator must be installed on your Newton. GraFX will only run from the calculator.

Additional requirements:

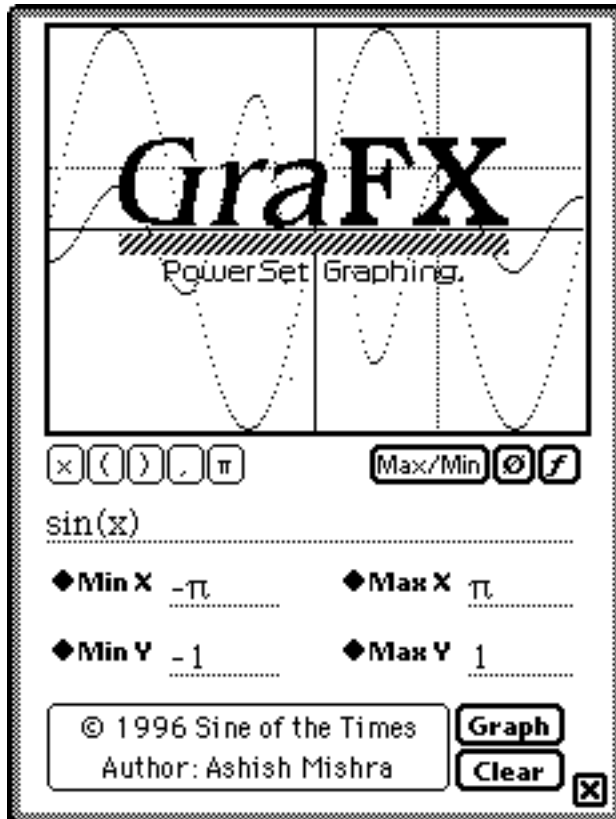
- 23 kb of RAM
- 1.2 kb of heap

To install GraFX, simply download the package to your Newton using a package installer, or the Newton Connection Kit.

# Using GraFX

## Running GraFX

To run GraFX, select the **GraFX** button from the Eclipse PowerSet Calculator. GraFX will load and appear as below:



## Graphing a Function

GraFX allows you to graph a single function  $y$  dependent on variable  $x$ . To graph a function, follow the steps below:

1. Specify the **function** to graph on the function entry line.

$\sin(x)$  .....

2. Specify the **range** of the graph.

◆ **Min X**  $-\pi$  .....

◆ **Max X**  $\pi$  .....

◆ **Min Y**  $-1$  .....

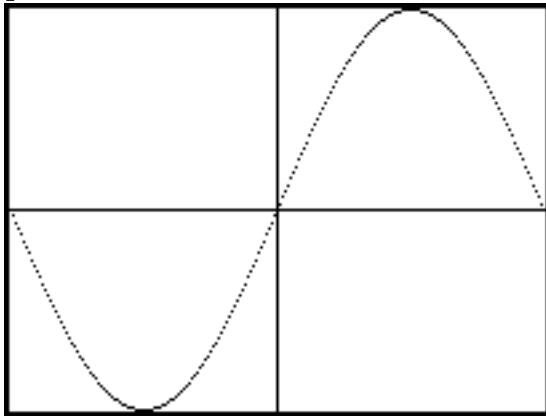
◆ **Max Y**  $1$  .....

3. Press the Graph button.

**Graph**

**Clear**

If for example you plotted the function as specified above, a graph would be plotted as below:



Notes:

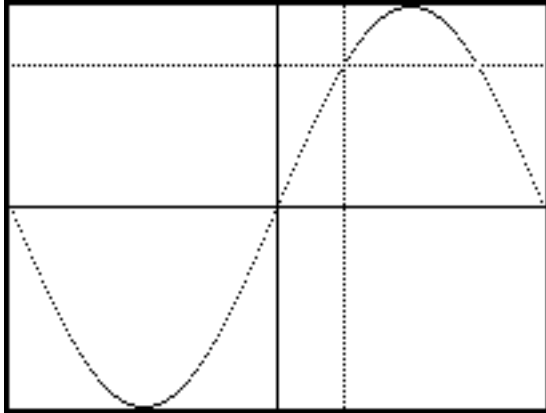
1. Trigonometric functions are available in **RAD**ians only.
2. Polynomials must be expressed using **pow(x,p)** which is  $x^p$  or  $(x^p)$ .
3. The function  $y$  to be graphed can only be a variable of  $x$ .

### ***Using the Cursor***

GraFX can report the  $x$  and  $y$  values of any point of a graphed function.

To use the cursor, simply select any point on the graph. GraFX will report the function's  $y$  value at the specified  $x$  position. In the display box at the bottom of the screen.

For example, select a point on the  $\sin(x)$  curve, similar to the one below.



GraFX will report the cursor's position in the display box:

$x = 0.79 (0.25\pi)$ $y = 0.71$
------------------------------------

You can select another position to examine by simply choosing a new point. The cursor will move to the new point.

## Zooming

GraFX provides you with the ability to zoom the graph by 120% about the center of the graph, or about a particular point.

To zoom, press the  $\times 1.2$  button.

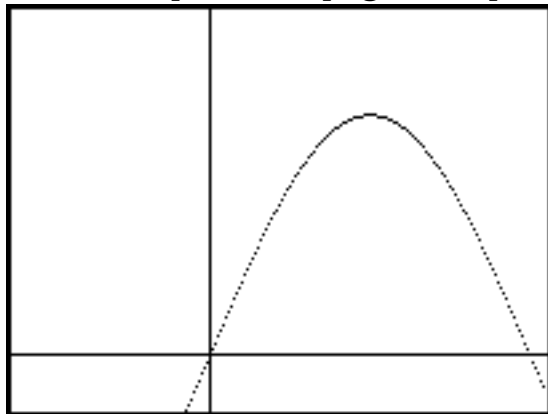
GraFX will Zoom about the center of the graph if no point on the function has been selected (ie. no cursor is visible).

GraFX will Zoom about the point of a graph, if a cursor is showing.

After Zooming, GraFX automatically updates the new range of the function (ie. the min x, max x, min y, max y values).

**TIP:** By pressing the **UNDO** button and then pressing **Graph**, you can restore the previous graph.

For example, pressing the  $\times 1.2$  on the  $\sin(x)$  function with a point selected as on the previous page, will produce:



$\times$  ( ) ,  $\pi$   $\times 1.2$  Max/Min  $\otimes$   $f$

$\sin(x)$

◆ Min X -1.94      ◆ Max X 3.30

◆ Min Y -0.23      ◆ Max Y 1.44

120% Zoom Completed      Graph Clear  $\times$

## ***Maximum and Minimum***

GraFX can report the maximum and minimum value of a function in the specified X range. Even if the y-value of a plot does not appear on the graph, you can find the maximum and minimum y values.

To find the **maximum** and **minimum** in the specified x range, press .

For the  $\sin(x)$  example, GraFX will report these results in the display box:






Maximum =	1
Minimum =	-1

## ***The Display Box***



GraFX uses this area of the screen to display comments while you are using the package.

All items in the display box are selectable by highlighting and dragging.

## ***Reflex Keys***

Common characters required in functions, can be inserted into the function entry line, by selecting any of .

## ***Function Lists***

Common functions can be selected from lists by pressing any of .

## ***Entering Functions***

### **Example:**

$x^3+2x^2-\ln(x)$

$2x^3-4x^2-\log(x)$

$\cos(x/2)\sin(x)$

$\sqrt{x}$

$|x|/\cos(x)$

$3e^{2x}$

$.2x$

$5e^3$

### **Enter on function line:**

$\text{pow}(x,3)+2*\text{pow}(x,2)-\log(x)$

$2*\text{pow}(x,3)-4*\text{pow}(x,2)-\log10(x)$

$\cos(x/2)*\sin(x)$

$\text{sqrt}(x)$

$\text{abs}(x)/\cos(x)$

$3*\text{exp}(2*x)$

$0.2*x$

$5.e^3$

### **Notes:**

log is natural log

log10 is base 10 log

no implied multiplication

sqrt is  $\sqrt{\quad}$

abs is  $|\quad|$

exp is e

0 required before decimal

decimal point before e