

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:

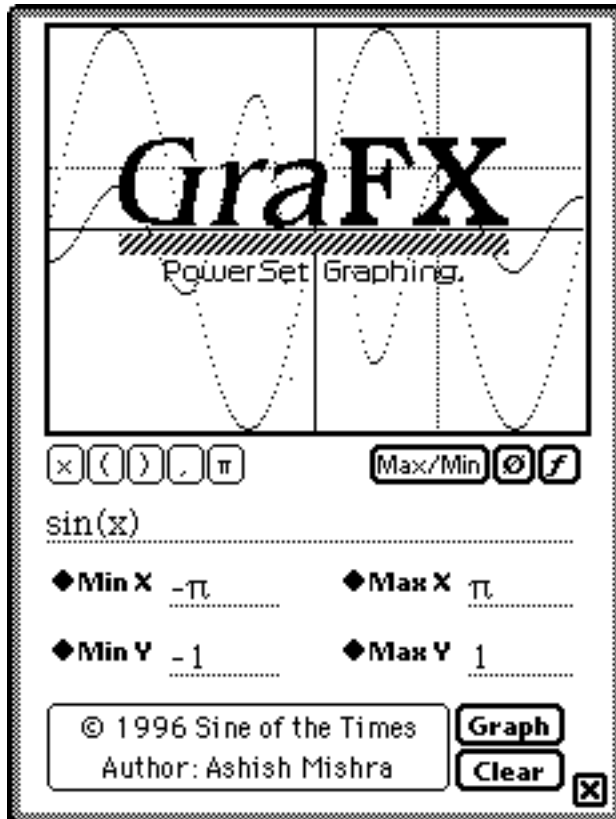
- 23 kb of RAM
- 1.2 kb of heap

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** π

◆ **Min Y** -1

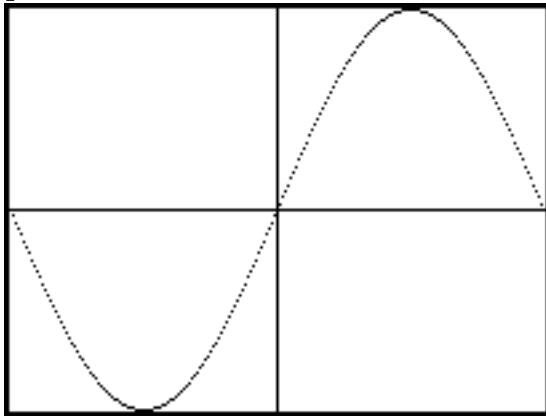
◆ **Max Y** 1

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:

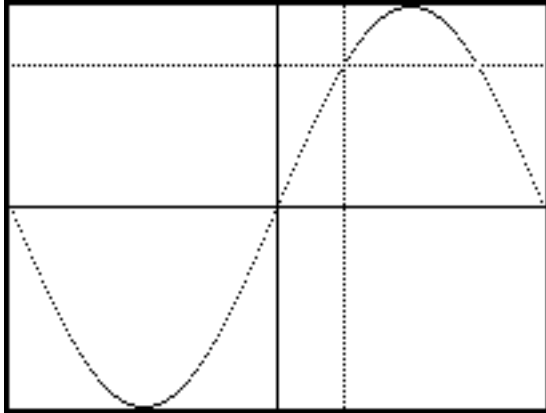
1. Trigonometric functions are available in **RAD**ians only.
2. Polynomials must be expressed using **pow(x,p)** which is x^p or (x^p) .
3. The function y to be graphed can only be a variable of x .

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.

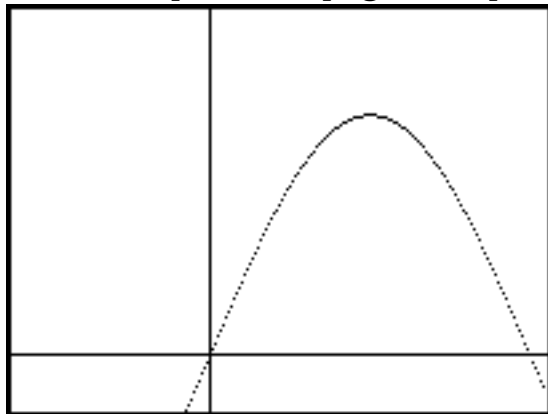
GraFX will Zoom about the center of the graph if no point on the function has been selected (ie. no cursor is visible).

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 () , π $\times 1.2$ 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 hiliting 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