AGrapher

This is a list of available topics:

Data Entry
Printing
Menu Items

GENERAL INFORMATION

You can use any of the functions listed under the Type in Equation to help you enter values in dialog boxes. They must be used with constant values in these cases. (I.e. sin(PI/2) would be fine, but sin(x) would cause problems.) You can also use PI when you want PI used in your calculations. * (multiply), / (divide), + (add), - (subtract), ^ (exponentiation) all also work in entering values in dialog boxes.

Pressing and releasing the left mouse button on a graph will cause the location of the cursor to be displayed in the upper left part of the graph.

Pressing and releasing the right mouse button on a graph will cause the current equation to be displayed at the cursor position. You can display many copies of the equation, but only the last location will be displayed after a redraw command.

Data Entry

The Equation you want to graph is chosen from the Equation Menu.
The coefficients desired are typed in the number entry boxes.
The OK button is clicked.

Printing Your Graphs

Use the Setup Printer item under the File Menu to select the printer.
When the printer is configured use the Print item under the File Menu.

Menu Items

File
Equation
View
Information
Transform
Drawing
Recall
Help

Return to Contents page

File

Print: sends the current graph window to the printer
Printer Setup: gives the standard Windows 3.1 printer dialog. This dialog lets you choose the printer, paper type and for some printers other parameters before you use a printer.
Save Defaults: saves the scale you have chosen for use when the program restarts
Quit: ends the AGrapher program
Print Registration Information: This item will print the information needed to obtain a fully licensed copy of AGrapher

Equation

Allows you to enter the equation you wish to draw. The following lists the types of equations you can choose from.

Linear Equation
Quadratic Equation
Cubic Equation
Quartic Equation
General Quadratic Equation
Trigonometric Equation
Exponential Equation
Composite Equation
Conics
Type in Equation

View

The View Menu allows you to alter what appears on the screen. You can Clear the screen, Redraw the screen, change the drawing Scale, change the point that appears at the Center of the screen, and using Multi-draw see the effects of changing a coefficient in an equation.

Clear
Redraw
Multi-Draw
Scale
Center
Zoom In
Zoom Out
Sizing Factor
Stretch
Shrink
Draw Tangent
Stop Draw Tangent
Area

Information

The Information Menu allows you to show the Equation of the current graph, see the Root of a polynomial equation, find out About the program, find roots of functions, and get interesting information about graphs of conics.

About: Gives information about the version of AGrapher being used
Show Equation: Lists the equation of the current graph
Find Roots: Searches for roots to the current equation between two limits you specify. May not give values around singularities
Show Roots: AGrapher calculates the roots of polynomials as they are being graphed. This item gives you the roots for polynomials.
Type & Etc.: Gives information about General Quadratic form graphs. It tells about rotations from standard position for the ellipse and the hyperbola.

Transform

Changes the current equation

Rotate
Reflect
Derivative
Anti-Derivative

Drawing

Draw: Draws the graph of the current equation. This item is needed if you use the Recall Menu to choose an equation. You can use this menu to see the standard conic that is described in the Information Menu item Type and Etc. You can also use this item to draw any of the tangents that you make when DRAW TANGENTS is active.

x-axis named using decimals: uses decimal notation for the labels on the x-axis

x-axis named using PI: uses multiples of fractions of PI to label the x-axis

x subdivisions: chooses the number of divisions per unit shown on the x-axis

y subdivisions: chooses the number of divisions per unit shown on the y-axis

Recall

The Recall Menu lists the equations you have used to draw graphs in the current session.

Recall stores 100 graphs before deleting the most recently graphed equation. You select an equation you have drawn before.

Help

Starts the Windows Help Facility with this file as the active contents.

Rotate from Transform Menu

Allows you to Rotate certain graphs by a specified degree amount. You can rotate any graph that can be represented by the General Quadratic equation.

Reflect from Transform Menu

Allows reflection of graphs in the lines $y = x$, $y = -x$, $y = 0$, and $x = 0$.

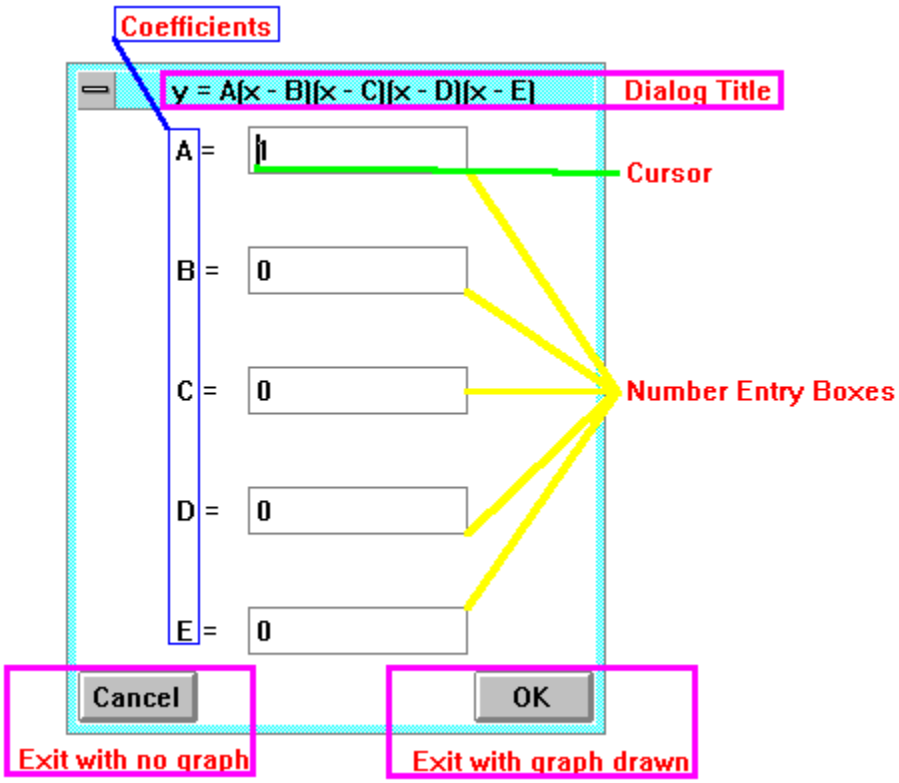
Derivative from Transform Menu

Finds the derivative of functions. (Not ones you type in yourself.)

Anti-Derivative from Transform Menu

Finds the anti-derivative of functions. (Not ones you type in yourself.)

Sample Entry Dialog



You move from one Number Entry Box to the next by using the TAB key (or SHIFT-TAB for the reverse direction). You click on the OK button to graph the equation (or TAB to the OK button and press the ENTER key). The CANCEL button leaves without drawing a new graph.

Linear Equation

Draws a line from two points, from the point-slope form, or from the slope-intercept form

Quadratic Equation

Draws a parbola from two roots, from standard form or from intercept-center form

Cubic Equation

Draws third degree graph from three roots or from the standard form

Quartic Equation

Draws a fourth degree graph from four roots or from the standard form

General Quadratic Equation

Draws graphs from equations of the general quadratic form. The xy term makes these very interesting.

Trigonometric Equation

Draws sine, cosine, tangent, cosecant, secant and cotangent graphs

Exponential Equation

Draws logarithmic and exponential graphs.

Composite Equation

Uses two equations already entered to build a new function. Once you have chosen the functions f and g, you choose the Type of composite you want from f+g, f-g, f*g, f/g, f(g), or 1/f.

Conics

Graphs hyperbolas, ellipses and parabolas in several ways.

A Parabola can be graphed from an equation or from a locus definition. You give the equation of the directrix line and the focus point.

An Ellipse can be graphed in three ways. You give an equation with two positive values. You use a locus definition by giving two focus points and a fixed distance, and by using a line, a point and eccentricity.

A Hyperbola can be graphed in three ways. You give an equation with two values (one positive and one negative). You use a locus definition by giving two focus points and a fixed difference, and by using a line, a point and eccentricity.

Type in Equation

The TYPE IN EQUATION item allows you to create your own equation. The dependant variable must be x. Multiplications must use *, divisions must use /, additions must use +, exponents can be entered after a ^, and subtractions must use -. You can use any of the following functions in your equation: ABS, ACOS, ASIN, ATAN, COSH, COS, LOG, LN, SINH, SIN, SQRT, SQR, and TANH. Here are a couple of samples of equations.

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x * sin(x)/(x + 2)
x*(x-1)*(x-2)*(x-3)*(x+1)*(x+2)
```

Clear

Erases the screen to a green background

Redraw

Clears the screen and redraws the current graphs

Multi-Draw

Allows several graphs to be drawn with only one coefficient varying between them

Scale

The values for Scale give the number of screen pixels for a unit on the graph. A large value makes less of the graph appear, but in greater detail. Zoom, Stretch and Shrink change the Scale values by a factor of 2 unless the Sizing Factor is changed.

Centre

Lets you move the origin from the centre of the screen

Zoom In

Enlarges the graph by an amount set by the Sizing Factor which by default is 2

Zoom Out

Shrinks the graph by an amount set by the Sizing Factor which by default is 2

Sizing Factor

A value that determines how much change takes place when using Zoom In, Zoom Out, Stretch and Shrink. For Zoom In and Stretch the Sizing Factor tells how much larger things will get.

Stretch

Allows independent enlargements on the horizontal and vertical axes

Shrink

Allows independent reductions on the horizontal and vertical axes

Draw Tangent

The Draw Tangents and Stop Draw Tangents let you toggle between drawing a tangent line to the current graph and not drawing one. In the drawing mode, you get a line tangent to the current graph at the cursor x- value whenever you release the left mouse button.

Stop Draw Tangent

The Draw Tangents and Stop Draw Tangents let you toggle between drawing a tangent line to the current graph and not drawing one. In the drawing mode, you get a line tangent to the current graph at the cursor x- value whenever you release the left mouse button.

Area

The Rectangle Area item lets you approximate the area between the current graph and the x-axis. You decide the end-points of the region to find the area in and the number of rectangles that should be drawn to approximate the area. The calculated value appears in the upper left of the screen in red lettering. The rectangles are drawn in red on the screen. The rectangles do not appear after a REDRAW.

The Monte Carlo Area item lets you approximate the area between the current graph and the x-axis. You decide the end-points of the region to find the area of and the number of random points to pick between the end-points. The calculated value is placed in the upper left part of the screen in green. Vertical lines are drawn at each of the random points used in the calculation. The lines to not appear after a REDRAW.