CASIO

Simply Calculate The Difference!

QUICK START GUIDE
fx-9750GIII

Selecting the RUN-MATRIX icon will allow you to perform general computations and arithmetic.

The function keys allow you to access the tab (soft key) menus that will come up at the bottom of the screen. When an ▶ appears above the F6 key, selecting F6 will offer more on-screen choices.

The MENU key displays every mode the calculator has. To select a mode, you may ▶ ▲ to the desired icon and press EXE or press the number or letter in the lower right hand corner of the icon.

The EXIT key operates like the back arrow on a web browser; it will take you back one screen each time you select it. The EXIT key *will not* take you to the icon menu.

The S↔D key is a toggle key that will change answers or entered numbers back and forth from decimal to standard form.

The AC/ON key will power the unit on. To turn the unit off, press SHIFT AC/ON.

The key is used to obtain a fraction bar. To obtain a mixed number, press SHIFT .

The EXE key executes operations. When data is entered, the EXE button must be pressed to store the data.

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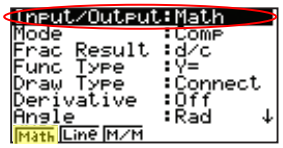
The following explains the meaning of each icon on the fx-9750GIII icon menu

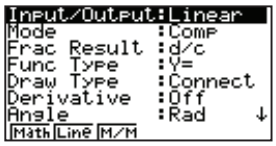
ICON	MENU NAME	DESCRIPTION
	RUN-MATRIX	This icon menu is used for general computations, including absolute value, logs of any base, summation, derivatives, integrals, and matricies.
	STATISTICS	This icon menu is used to perform single-variable (standard deviation) and paired variable (regression) statistical calculations, to perform tests, to analyze data and to draw statistical graphs.
	eACTIVITY	eActivity allows for the input of text, math expressions, and other data in a notebook-like interface. Use this mode when you want to store text, formulas, or built-in application data in a file.
	SPREADSHEET	This icon menu is used for creating spreadsheets.
	GRAPH	This icon menu is used to quickly draw, store and calculate information of functions. Can graph polar, parametric, x=, and inequality graphs on the same screen.
	DYNAMIC GRAPH	This icon menu is used to draw multiple versions of a graph by changing certain values in the function.
	TABLE	This icon menu is used to store functions, to generate a numeric table of different solutions as the values assigned to variables in a function change, and to draw graphs.
	RECURSION	This icon menu is used to store recursive formulas, to generate a numeric table of different solutions as the values assigned to the variables in a function change, and to draw graphs.
	CONICS	This icon menu is used to graph parabolas, circles, ellipses, and hyperbolas. You can input a rectangular or polar coordinate function or a parametric function for graphing.
	EQUATION	This icon menu is used to solve linear equations with two through six unknowns, and higher-order equations from 2nd to 6th degree.
	PROGRAM	This icon menu is used to store programs in the program area and to run programs.
	TIME VALUE OF MONEY	This icon menu is used to perform financial calculations and to create cash flow and other types of graphs.
	DATA ANALYZER LINK	This icon menu is used to control the optionally available CLAB Data Analyzer. For information about this icon menu, download the E-CON3 manual from http://edu.casio.com.
	LINK	This icon menu is used to transfer memory contents, back-up data to another unit or PC, and enter Exam Mode.
	MEMORY	This icon menu is used to manage data stored in memory.
	SYSTEM	This icon menu is used to initialize memory, adjust contrast, reset memory, and to manage other system settings.
	PYHON	This icon menu is used to create Python programming mode scripts and execute them.
	GEOMETRY	This icon menu is used to draw, analyze and animate geometric objects.

RUN-MAT

This section is an overview of the RUN-MAT Icon. To select an icon from the icon menu system, use the ◀ ▶ ▲ ▼ to highlight the desired icon, then press EXE or press the number/letter in the lower right corner of the icon. For the RUN menu, press 1 to display the initial screen.

Note: All operations in this handout will utilize the "Math" input/output mode, which allows natural input and display of certain functions, just as they appear in a textbook. To make sure your calculator is in "Math" mode, press SHIFT MENU F1 EXIT from the RUN menu. Linear Input & Output allows for single line input and display of certain functions. Math/Mix mode allows for natural input and single line display of radical functions. This is a combination of the Math and Linear modes. In Math/Mix, fractions are still displayed as they would appear in a textbook.



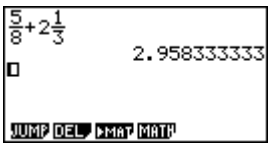


1. When performing general computations, you can press ▤ to enter fractions and mixed numbers. To solve the problem, $\frac{5}{8}+2\frac{1}{3}$ input the following:

   • ▤ 5 ▶ 8 ▶ + SHIFT ▤ 2 ▶ 1 ▶ 3 EXE

2. To change the answer, $\frac{71}{24}$, to a mixed number, press SHIFT S⇔D $(a\frac{b}{c} \leftrightarrow \frac{d}{c})$.

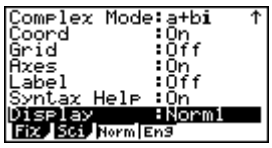
3. To change the answer to a decimal approximation, press S⇔D. S⇔D is a toggle key that will switch entered data or answers from standard form to its decimal approximation and back.

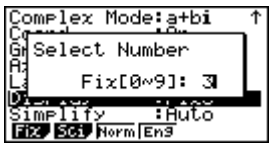


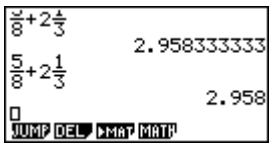
4. To change the displayed number of decimal places, enter the SET UP menu by pressing SHIFT MENU. ▼ to Display, select F1 (Fix) and enter the desired amount of decimal places followed by EXE. For this example, 3 decimal places are used.

Note: Every icon's SET UP menu is accessed in the same manner.

- SHIFT MENU ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ F1 3 EXE EXIT EXE S⇔D







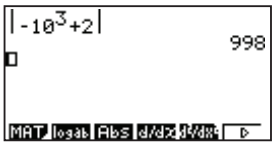
From the RUN menu, many calculations can be performed by selecting OPTN. For example: hyperbolic, probability/distribution, numeric (including differential and integration), conversion, engineering, complex number and binary, octal, decimal and hexadecimal calculations.

5. To calculate the number of different arrangements of 10 items when choosing 4 at a time, enter the following from the initial RUN screen:

- OPTN F6 F3 1 0 F2 4 EXE

6. To calculate $|-10^3 + 2|$, enter the following from the initial RUN screen:

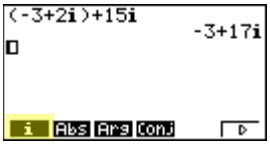
- F4 F3 (−) 1 0 ^ 3 ▶ + 2 EXE



Calculations can be performed with complex numbers and answers can be displayed in a+bi form.

7. To calculate (-3 + 2i) + 15i; enter the following:

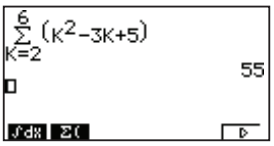
- OPTN F3 ((−) 3 + 2 F1) + 1 5 F1 EXE



Sigma calculations can also be performed in the RUN menu.

8. To calculate $\sum_{k=2}^{6}(k^2 - 3k + 5)$; enter the following:

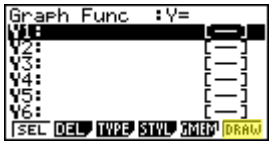
- F4 F6 F2 ALPHA , x^2 − 3 ALPHA , + 5 ▶ ALPHA , ▶ 2 ▶ 6 EXE



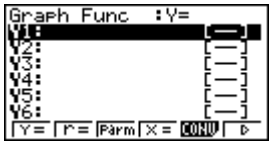
GRAPH

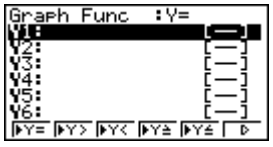
This section is an overview of the GRAPH Icon and will highlight some basic features of this mode. To enter the Graph menu, highlight the icon and press [EXE] or press [5].

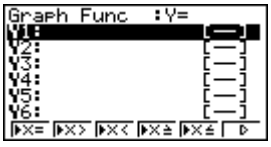
The initial screen is the function/relation editor. Enter a function in Y1 and press [EXE] to store it. To draw the function, press [F6] (DRAW).

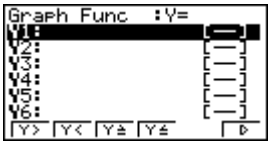


You can change the type of graph (r = polar coordinates, parametric functions, x =, and inequalities) by pressing [F3] (TYPE), then selecting the corresponding TYPE button. Press [▶] to begin inputting.





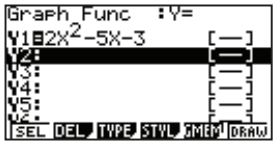


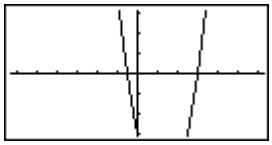


Note: When the TYPE of graph is changed, it only affects the current line and entries below it. Functions already stored are unchanged.

1. To draw the graph of the function $y = 2x^2 - 5x - 3$ from the Graph Editor screen, input the following:

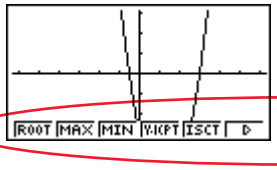
   - [2] [X,θ,T] [x^2] [−] [5] [X,θ,T] [−] [3] [EXE] [F6]

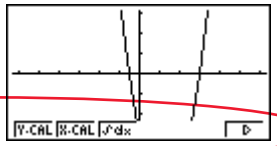




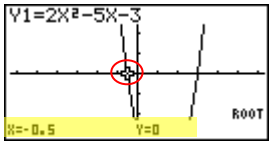
To quickly change your window, you can utilize the arrow buttons. Specific changes can be made to the viewing window by selecting [F3] (V-Window).

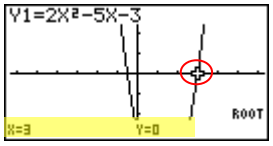
To analyze features of this graph (roots, maximum and minimums, y-intercepts, intersections, determine coordinates, and integrals), select [F5] (G-Solv).





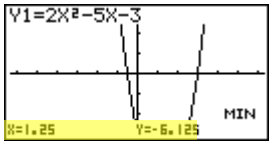
2. F1 (Root):





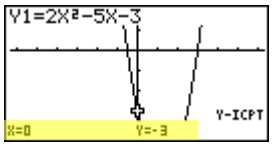
Note: The left-most root will always display first. To display the next root, simply press ▶.

3. F3 (Minimum):

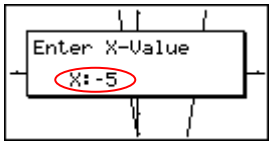


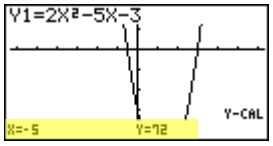
Note: As long as the x-value of your vertex is in the viewable domain; you do not need to see the vertex to calculate the minimum value. However, you can change the viewing window by selecting F3 (V-Window) *in the graph window.*

4. F4 (y-intercept):

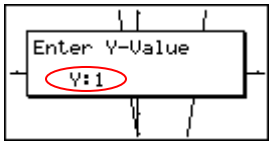


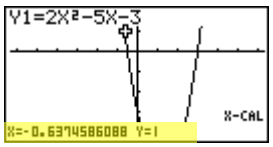
5. F1 (y-calculation): What is the value of *y* when *x* is -5?

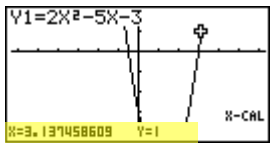




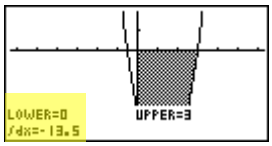
6. F2 (x-calculation): What is the value(s) of *x* when *y* is 1?







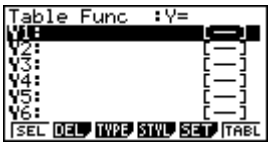
7. F3 (integral): Determine the integral value from (0, 3) for the function **Y1=** $2x^2 - 5x - 3$.



TABLE

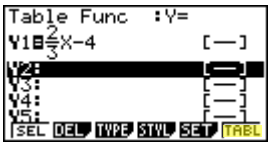
This section is an overview of the TABLE Icon. To select this icon, highlight it and press EXE or press 7.

Note: Functions previously entered in Graph will appear in Table.

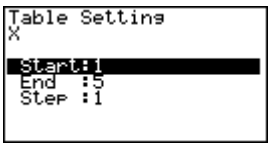


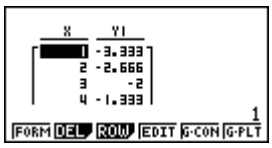
1. To see a table for the function $y = \frac{2}{3}x - 4$, highlight **Y1**: and input the following:

   • 2 ▶ 3 ▶ X,θ,T − 4 EXE

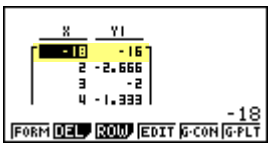


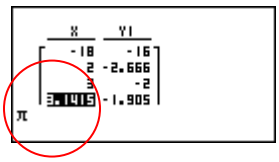
2. The default setting for tables is: X starts at 1, ends at 5, and increases by increments of 1. You change this by pressing F5 (SET). When complete, press EXIT, then F6 (TABL).

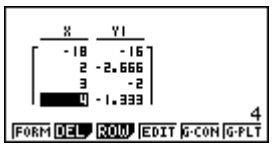


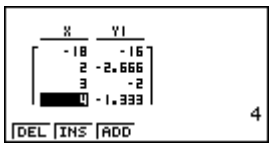


3. However, you can manually enter a number anywhere in the x-column of the table and press EXE to see the corresponding y-value (including fractions, decimals, even π). You can insert and delete rows in this view by pressing F3 (ROW). This is a quick way to customize your table.

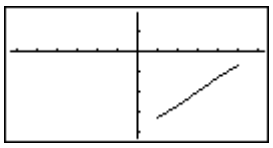
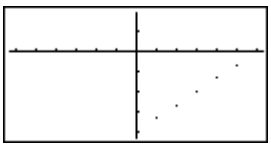




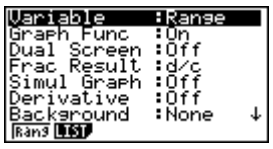


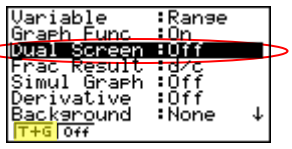


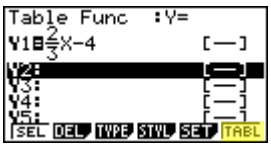
4. From the table view screen, you can press F5 (G-CON) to see a connected plot graph or F6 (G-PLT) to see a plot graph for the function you entered.

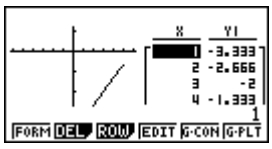



5. To see a split screen of your table and graph, press SHIFT MENU to enter the SET UP menu for the TABLE icon. Scroll down to Dual Screen, select F1 (T + G), EXIT, then F6 (TABL).





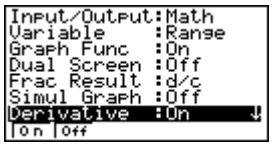


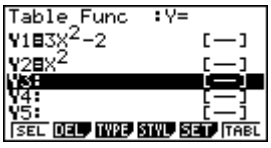


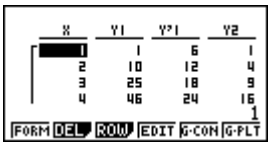
If you manually entered values to the previous table that you still want displayed, you can re-enter them here, then press EXE to see the graph of that table.

To generate a differential number table, press SHIFT MENU to enter the SET UP menu for the TABLE icon and ▼ to Derivative, select F1 (On), then EXIT.

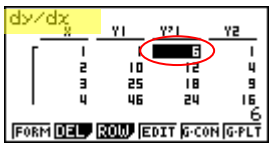
6. For this example, enter YI: $3x^2 - 2$ and Y2: x^2. Press F6 (TABL) to view the differential number table.

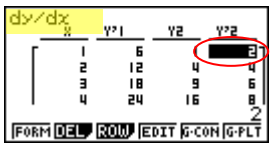






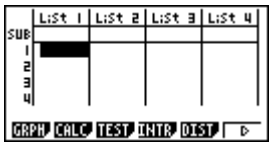
Note: Moving the cursor to a differential coefficient displays "dy/dx" in the top line, which indicates differential.





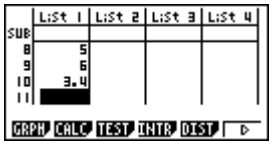
This section is an overview of the STAT Icon; it will highlight just a few of the features for single-variable data and paired-variable data. To select this icon, highlight it and press EXE or press 2.

The initial List Editor Screen allows input of statistical data and performs numerous statistical calculations. To input a list of single-variable data, highlight the first cell under **List 1** and enter each number followed by EXE.

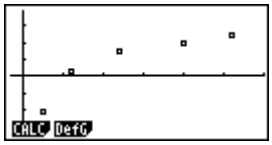


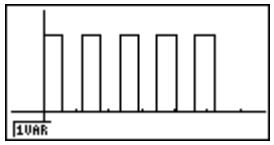
1. For this example, input this set of data:

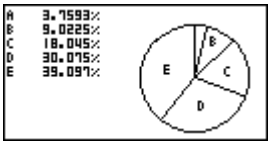
List 1	1	0.5	1	4	-1	1	3	5	6	3.4

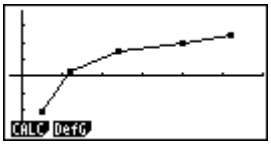


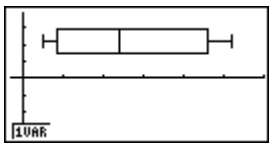
2. From this screen you can display various statistical graphs depending on whether you have single or paired-variable data (scatterplot, line, normal probability, histogram, median box, mean box, normal distribution, broken line, and regression: linear, quadratic, cubic, quartic, logarithmic, exponential, power, sinusoidal and logistic).

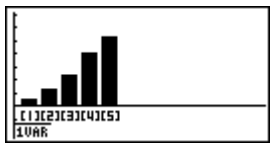


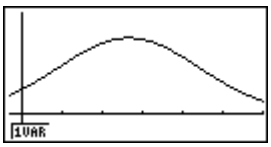


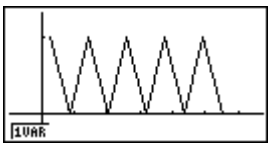




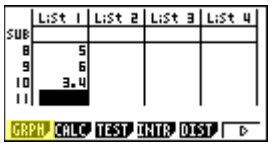


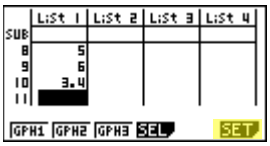


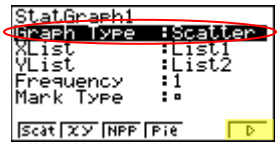




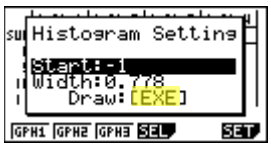
3. The initial default graph is a scatterplot. To change the type of graph you would like to use, press F1 (GRPH), F6 (SET), and arrow down to **Graph Type**. For this set of data, we will make a histogram, press F6, and then F1 for histogram.

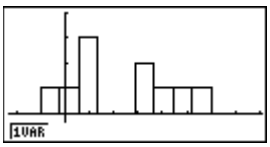




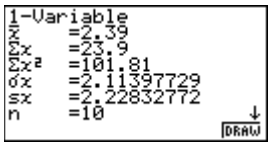


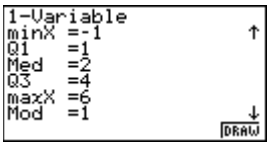
4. Press EXIT to return to your list of data, select F1 (GPH1) EXE to see your graph.

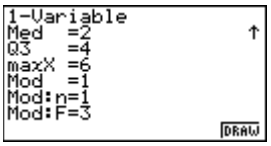




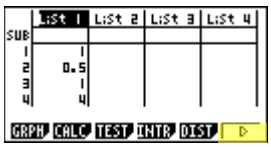
5. The following screenshots show one-variable calculations that can be obtained by pressing F1 (1-VAR).

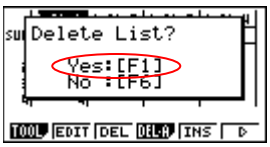


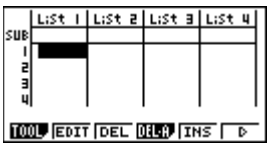




6. To delete this set of data, press EXIT until you return to the initial List Editor screen. Select F6 for more options, select F4 (Del-A), then F1 (Yes).



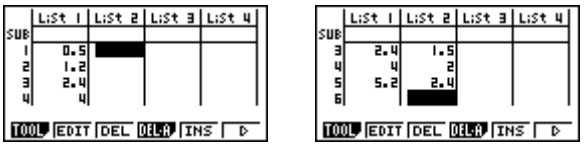




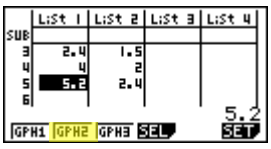
7. For paired variable data, use the following:

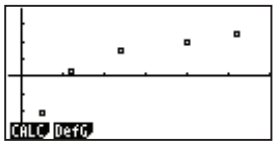
List 1	0.5	1.2	2.4	4	5.2
List 2	-2.1	0.3	1.5	2	2.4

Enter **List 1** first, and then ▶ to begin entering **List 2**. The cursor will automatically move to the beginning of the next list.

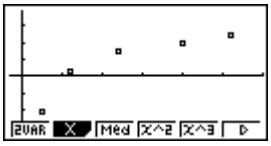


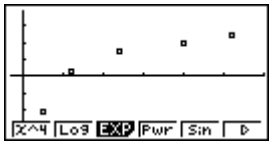
8. To see a scatterplot of these data, go through and change GPH 1 back, using the process above, or select F2 (GPH 2) from the List Editor screen whose default is also a scatterplot.

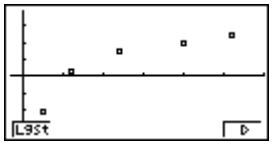




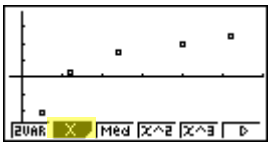
9. From the scatterplot screen, pressing F1 (CALC) will show all the calculations that can be obtained from this set of data.

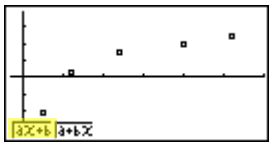


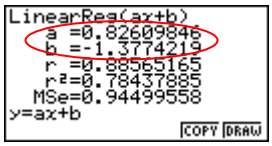




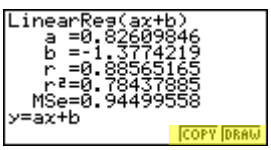
10. To calculate a linear regression for these data, select F2 (X) from the first set of options and then press F1 or F2 for the preferred form. For this example, we will use y = ax + b.

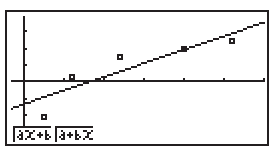






11. From this screen, select F5 (COPY) to copy and then paste the regression equation into the initial Graph screen or select F6 (DRAW) to show the linear regression.

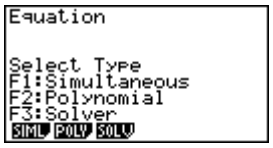




EQUATION

This section is an overview of the EQUATION Icon. To select this icon, highlight it and press EXE or press X,θ,T.

The initial Equation Editor screen has three modes to choose from, Simultaneous, Polynomial, and Solver; this section will give an overview of each mode.



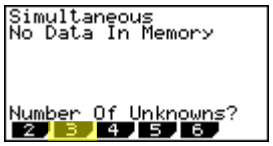
The Simultaneous mode allows you to solve simultaneous linear equations that contain two to six unknowns.

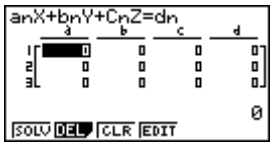
1. Solve the following system of equations:

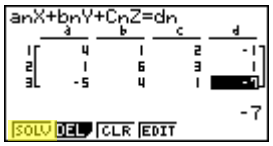
$$\begin{cases} 4x + y - 2z = -1 \\ x + 6y + 3z = 1 \\ -5x + 4y + z = -7 \end{cases}$$

Press F1 (SIML) to select the Simultaneous mode and press F2 (3) for three unknowns. The calculator will display a matrix where the coefficients and constants can be entered in, as long as each equation is in *standard* form. To enter this system of equations (already in standard form), input the following:

- 4 EXE 1 EXE (−) 2 EXE (−) 1 EXE
- 1 EXE 6 EXE 3 EXE 1 EXE
- (−) 5 EXE 4 EXE 1 EXE (−) 7 EXE

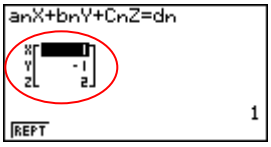






There are four options at the bottom of the screen, press F1 (SOLV). The solution to this system is (1, -1, 2).

$$\begin{bmatrix} x = 1 \\ y = -1 \\ z = 2 \end{bmatrix}$$

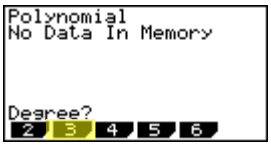


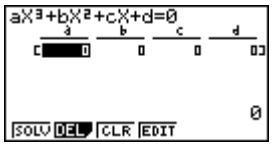
Press [F1](REPT) to edit this problem or continue solving simultaneous equations with three unknowns. To edit just one of the numbers in the system, arrow to the number to be edited and press [F4](EDIT) or highlight the number to be edited, enter the new number, and press [EXE].

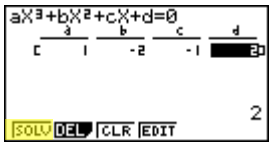
Press [EXIT] until the initial Equation Editor screen is displayed. The second mode is Polynomial ([F2]) and can be used to solve higher-order equations (in standard form), from the second to sixth degree.

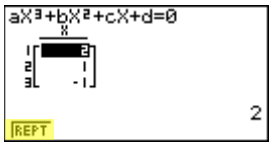
2. To solve the equation $x^3 - 2x^2 - x + 2 = 0$, input the following:

   - [F2](POLY)[F2](3)[1][EXE][(–)][2][EXE][(–)][1][EXE][2][EXE][F1](SOLV)

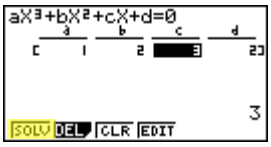


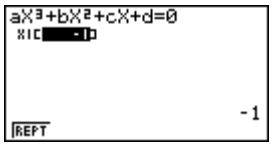




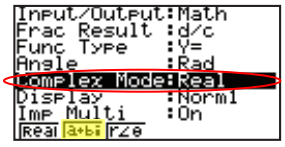


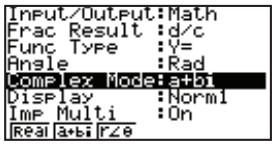
3. To change the equation to $x^3 + 2x^2 + 3x + 2 = 0$, select [F1](REPT) and change the b- value to 2, the c-value to 3 and press [F1](SOLV).

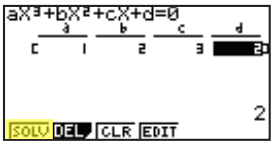


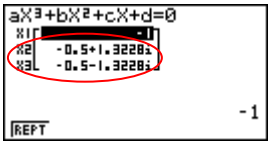


4. The default setting is for real numbers; to change the display to a+bi form, press [SHIFT][MENU] for the Equation SET UP menu, highlight Complex Mode, select [F2](a+bi), [EXIT], then [F1](SOLV).





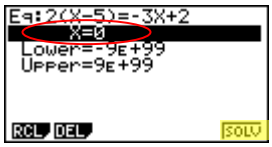


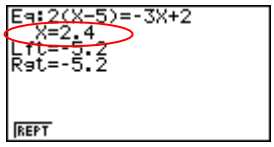


Solver is the third function and allows you to determine the value of any variable in a formula or equation. You can input any formula exactly as it appears using [ALPHA] for any variables. In this example, we will solve a linear equation and a formula.

5. To find the value of x in the following equation, 2(x - 5) = -3x + 2, input the following, starting from the initial Equation Editor Screen:

   • [F3](SOLV) [2] [(] [X,θ,T] [−] [5] [)] [SHIFT] [•] [(−)] [3] [X,θ,T] [+] [2] [EXE] [F6](SOLV)





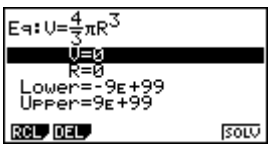
Note: In the last screen, "Lft" and "Rgt" represent the values of the left and right sides of the equation using the value of the solution; this is the calculator's way of checking the solution.

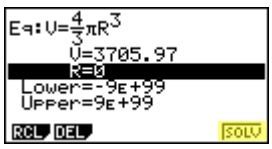
You can also enter a formula, assign values, and solve for a specific variable using the Solver function of the Equation Editor.

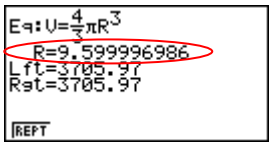
Note: Selecting [F1](REPT) *will take you back to the previous screen where you can edit and re-solve the previous equation or begin a new problem.*

6. Find the radius (to the nearest hundredth) of a sphere, whose volume is 3705.97 cm^3. To enter the formula $V = \frac{4}{3}\pi r^3$, input the following into the calculator:

   • [F1](REPT) [▲] [ALPHA] [2] [SHIFT] [•] [□] [4] [▶] [3] [▶] [SHIFT] [×10^x] [ALPHA] [6] [^] [3] [EXE]
   • Highlight V= and enter [3] [7] [0] [5] [•] [9] [7] [EXE]
   • Press [F6](SOLV)



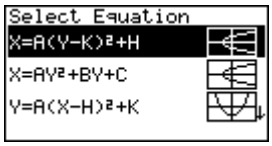


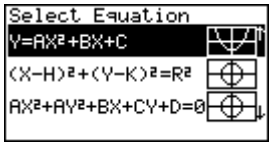


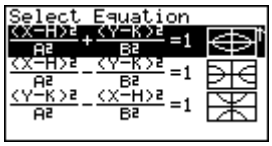
CONICS

This section is an overview of the CONICS Icon. To select this icon, highlight it and press EXE or press 9.

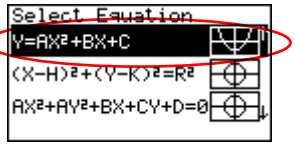
The initial CONICS screen allows you to choose from various conic functions, including rectangular, polar or parametric form. You may use ▲ ▼ to select the equation of the function in accordance with the type of graph you want to draw. Once you have chosen the conic function you would like to graph, press EXE. Enter the coefficients of the function and press F6 (DRAW).

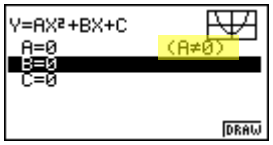


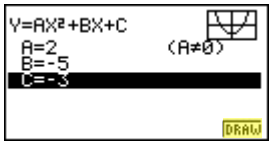


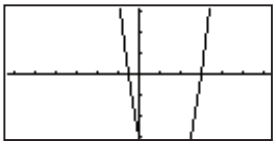


1. To view the graph of the conic: $y = 2x^2 - 5x - 3$, select the $Y = AX^2 + BX + C$ form from the Conics formula menu. Enter the coefficients and press F6 (DRAW).

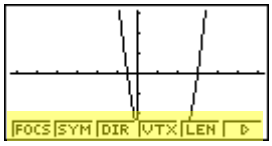


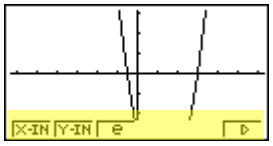




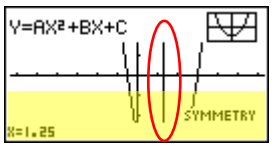


In the Conics modes, when you press F5 (G-Solv), although you are still graphing a parabola like in the Graph mode, notice how the vocabulary and options have changed to be conic specific.





2. For example, you can now examine the line of symmetry for this parabola and the equation of that line will be displayed. To see the line of symmetry, press F2 (SYM).



You can continue to analyze different areas of this graph and the line of symmetry will continue to be displayed.

NOTES

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