

Familiar With ALGEBRA FX 2.0

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This workshop is designed to explore many of the most basic functions of the calculator. Also try to familiar with things that the Casio Algebra FX 2.0 is capable of doing. This workshop consists of three parts. The first section is about how to operate the calculator. The second section introduces the MENU keys and their functions. The third section demonstrates some algebraic examples and shows what the Casio Algebra FX 2.0 can do.

Section One: HOW?

Q: How do I turn it on?

A: Press [AC^{ON}]

Q: How do I turn it off?

A: Press [SHIFT] [AC^{ON}]

Q: How do I change the contrast so that I can see the screen better?

A: Press [COS] when viewing the Menu or using the arrow keys to highlight

[SYSTEM] and pressing [EXE] will access the system Manager. Press [F2] to choose 'Contrast'. Using the arrow keys, you can adjust the contrast to either darker or lighter. To back up to the previous screen, press [ESC]. To exit System Manager, press [Menu].

Q: How do I access yellow functions above the keys?

A: Pressing [SHIFT] before a key will access any function written in yellow above a key.

Q: How do I access alphabet above the keys?

A: Pressing [ALPHA] before a key will access any alphabet written in red above a key.

Q: How do I clear what is on the screen?

A: In the RUN mode, pressing [AC^{ON}] to clear any displayed formulas, numeric values, or text. At times when [AC^{ON}] does not clear screen, press [ESC].

Q: Where do I find the [=] key on my calculator?

A: The [=] key is replaced by the [EXE] key.

Q: Do I have to start over if I make a mistake in entering an expression?

A: No. If you make a mistake while entering the expression, you can use the [] and [] keys to move the cursor to the position you want to change. Press [DEL] to delete any unwanted input, and type the corrected input. To insert a step, move the cursor to the position at which you wish to input the step. The calculator's default is 'insert' mode. Simply type the missing step. Pressing [SHIFT] [DEL] will toggle between 'insert' mode and 'typeover' mode.

Q: Can I scroll up to see the last expression(s) entered?

A: Yes. If you press [] and [], you will recall the last expression entered and can edit it. If you have cleared the screen first, you can use to return to previously entered expression and edit them.

Q: What are the keys labeled [F1] through [F6]?

A: Many of the operations performed by this calculator can be executed by pressing function keys [F1] through [F6]. The operation assigned to each function key changes according to the mode the calculator is in and is indicated by function menus that appear at the bottom of the display.

Section Two: The MENU

The MENU contains 14 icons. The following list is what you can do by selecting each.

ICON	FUNCTIONS
RUN-MAT	<ul style="list-style-type: none">● Arithmetic calculation● Function calculations● Calculations involving matrices
STAT	<ul style="list-style-type: none">● Perform single-variable & paired-variable statistical calculations● Analyze data● Draw statistical graph
GRPH-TBL	<ul style="list-style-type: none">● Store functions● Generate a numeric table of different solutions as the values assigned to variables in a function change● Draw graphs
DYNA	<ul style="list-style-type: none">● Store graph functions● Draw multiple versions of a graph by changing the values assigned to the variables in a function
RECUR	<ul style="list-style-type: none">● Store recursion functions● Generate a numeric table of different solutions as the values assigned to variables in a function change● Draw graph
CONICS	<ul style="list-style-type: none">● Draw graphs of implicit function
EQUA	<ul style="list-style-type: none">● Solve linear equations with two to thirty unknowns● Solve high degree (2 to 30) equations
PRGM	<ul style="list-style-type: none">● Store programs in the program area● Run program
CAS	<ul style="list-style-type: none">● Perform algebraic calculations
ALGEBRA	<ul style="list-style-type: none">● Step-by step solutions of expressions
TUTOR	<ul style="list-style-type: none">● Determine the expression type and solve mode● Interactive equation solutions
LINK	<ul style="list-style-type: none">● Transfer memory contents or back up data to another unit
MEMORY	<ul style="list-style-type: none">● Manage data stored in memory
SYSTEM	<ul style="list-style-type: none">● Initialize memory● Adjust contrast● Make other system settings

The RUN-MAT Mode

1. Press MENU to display the Main Menu.
2. Use arrow keys to highlight RUN-MAT and then press EXE

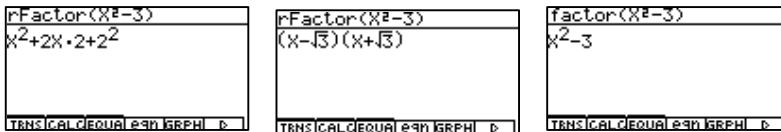
Section Three: Algebraic Examples

In the following examples, we will demonstrate step by step of how to use Casio LGBRA FX 2.0 graphing calculator's CAS to do the basic mathematics problems.

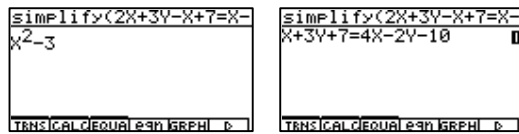
1) Expand $(x+2)^2$, we get $(x+2)^2 = x^2 + 2x \cdot 2 + 4$.



2) Factor $x^2 - 3$, we get $x^2 - 3 = (x - \sqrt{3})(x + \sqrt{3})$.

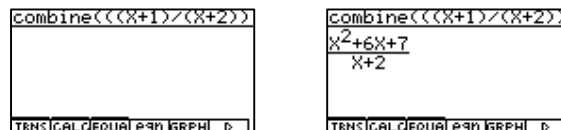


3) Simplify $2x+3y-x+7=x-2y+3x-10$, we get $x+3y+7=4x-2y-10$.

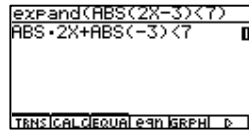


4) Combine $\frac{x+1}{x+2} + (x+3)$, we get $\frac{x+1}{x+2} + (x+3) = \frac{(x+1) + (x+2)(x+3)}{x+2}$

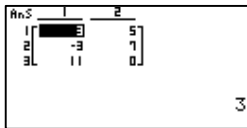
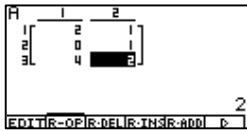
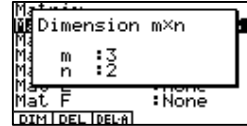
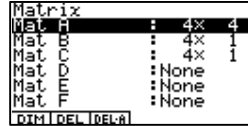
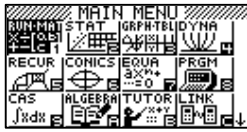
$$\frac{x+1+x^2+2x+3x+6}{x+2} = \frac{x^2+7x+7}{x+2}$$



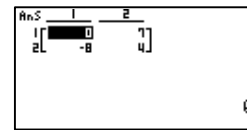
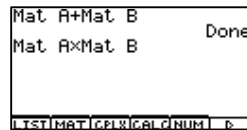
5) Expand the inequality $|2x - 3| < 7$, we get $2x - 3 < 7$ and $2x - 3 > -7$.



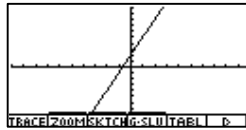
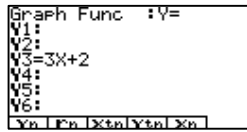
6) Find the sum of two matrices $\begin{bmatrix} 2 & 1 \\ 0 & 1 \\ 4 & 2 \end{bmatrix} + \begin{bmatrix} 1 & 4 \\ -3 & 6 \\ 7 & -2 \end{bmatrix}$, we get $\begin{bmatrix} 3 & 5 \\ -3 & 7 \\ 11 & 0 \end{bmatrix}$.



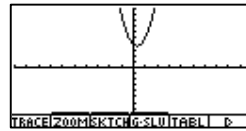
7) Find the product of two matrices $\begin{bmatrix} 2 & 1 \\ 0 & 4 \end{bmatrix} * \begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$, we get $\begin{bmatrix} 0 & 7 \\ -8 & 4 \end{bmatrix}$.



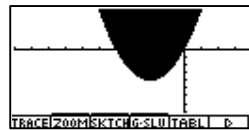
8) Draw the graph of the linear function: $y=3x+2$.



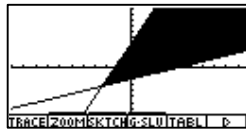
9) Draw the graph of the quadratic function: $y = 3x^2 - 2x + 4$.



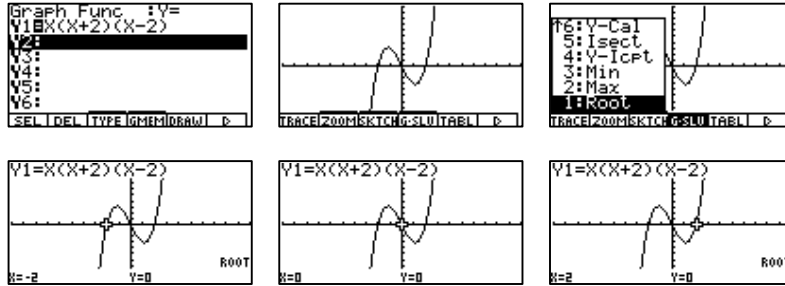
10) Draw the graph of an inequality function: $y > (x + 2)^2 - 4$.



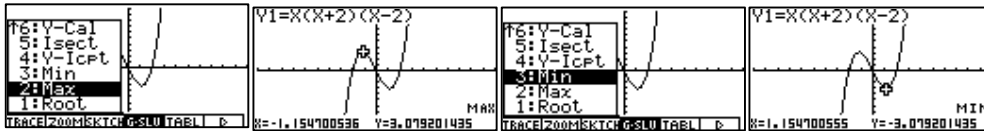
11) Draw the graph of system of linear equations: $y < 3x + 4$
 $y > \frac{1}{2}x - 2$



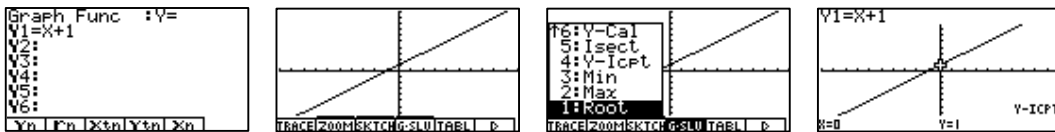
12) Find the roots of function: $y = x(x + 2)(x - 2)$, we get $\{-2, 0, 2\}$.



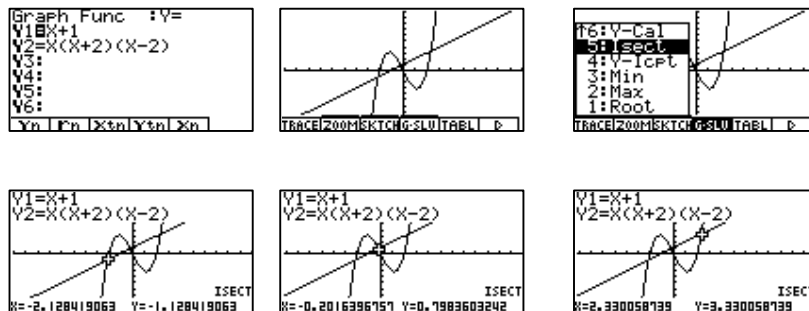
13) Determine the extreme of function: $y = x(x + 2)(x - 2)$, we get $\max(-1.15, 3.08)$ and $\min(1.15, -3.08)$.



14) Find the y-intercept of function: $y = x + 1$, we get $(0, 1)$.



15) Find the intersection of functions: $y = x + 1$ and $y = x(x + 2)(x - 2)$, we get $(-2.13, -1.13)$, $(-0.20, 0.80)$ and $(2.33, 3.33)$.



There are more things than we can imagine that can be done by the Casio Algebra FX 2.0. The best part of calculator teaching is that we do not have to tell students what the definitions are, but can quickly provide them with numerous examples, graphics and algebraic expressions, and then based on pattern recognition our students can come up with some definitions on their own.