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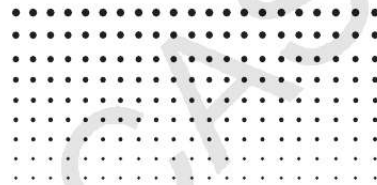
You can read the recommendations in the user guide, the technical guide or the installation guide for CASIO FX-CG20. You'll find the answers to all your questions on the CASIO FX-CG20 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual CASIO FX-CG20
User guide CASIO FX-CG20
Operating instructions CASIO FX-CG20
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Instruction manual CASIO FX-CG20



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fx-CG10
fx-CG20
Software
User's Guide



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on menu. When (g) is indicated in the function menu for key 6, it means that pressing 6 displays the next page or previous page of menu options. v u Menu Titles Menu titles in this User's Guide include the key operation required to display the menu being explained. The key operation for a menu that is displayed by pressing K and then {LIST} would be shown as: [OPTN]-[LIST].

6(g) key operations to change to another menu page are not shown in menu title key operations. u Command List The Program Mode Command List (page 8-51) provides a grasolutions as the values assigned to variables in a function change, and to draw graphs. Use this mode to draw graphs of conic sections. Recursion Conic Graphs Equation Use this mode to solve linear equations with two through six unknowns, and high-order equations from 2nd to 6th degree. Use this mode to store programs in the program area and to run programs.

Use this mode to perform financial calculations and to draw cash flow and other types of graphs. Use this mode to control the optionally available EA-200 Data Analyzer. Use this mode to transfer memory contents or back-up data to another unit or PC. Use this mode to manage data stored in memory. Program Financial E-Con2 Link Memory System Use this mode to initialize memory, adjust display brightness, and to make other system settings. Use this mode to draw and analyze geometric objects. Geometry Picture Plot Use this mode to plot points (that represent coordinates) on the screen and to perform various types of analysis based on the plotted data (coordinate values). 1-4 k About the Function Menu Use the function keys (1 to 6) to access the menus and commands in the menu bar along the bottom of the display screen. You can tell whether a menu bar item is a menu or a command by its appearance. k Status Bar The status bar is an area that displays messages and the current status of the calculator.

It is always displayed at the top of the screen. Icons are used to indicate the information described below. This icon: Indicates this: The current battery level. The icons indicated (from left to right): Level 3, Level 2, Level 1, Dead. See "Low Battery Message" (page 1-38) for more information. Important! If the Level 1 icon () appears, immediately replace the batteries. For details about battery replacement, see the separate "Hardware User's Guide". Calculation in progress. ! key was pressed and the calculator is standing by for the next key operation. a key was pressed and the calculator is standing by for the next key operation.

The icon indicates the lower-case input mode (eActivity and Program modes only). Alpha Lock (page 1-2) is in effect. !i(CLIP) was pressed and the calculator is standing by for range specification (page 1-11). Setup "Input/Output" setting. Setup "Angle" setting.



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· For information about other icons and messages that are specific to each application, see the chapters that cover each application.

1-5 k About Display Screens This calculator uses two types of display screens: a text screen and a graph screen. The text screen can show 21 columns and 8 lines of characters, with the bottom line used for the function key menu. The graph screen uses an area that measures 384 (W) × 216 (H) dots. **Text Screen** **Graph Screen** **k Normal Display** The calculator normally displays values up to 10 digits long. Values that exceed this limit are automatically converted to and displayed in exponential format. **u How to interpret exponential format** $1.2E+12$ indicates that the result is equivalent to 1.2×10^{12} . This means that you should move the decimal point in 1.2 twelve places to the right, because the exponent is positive.

This results in the value 1,200,000,000,000. $1.2E03$ indicates that the result is equivalent to 1.2×10^3 . This means that you should move the decimal point in 1.2 three places to the left, because the exponent is negative. This results in the value 0.0012. You can specify one of two different ranges for automatic changeover to normal display. **Norm 1** .

.....
.....
..... $102 (0.01) > |x|, |x| > 1010$ **Norm 2** .

.....
.....
... $109 (0.000000001) > |x|, |x| > 1010$ All of the examples in this manual show calculation results using Norm 1.

See page 2-13 for details on switching between Norm 1 and Norm 2. **1-6 k Special Display Formats** This calculator uses special display formats to indicate fractions, hexadecimal values, and degrees/minutes/seconds values. **u Fractions**

.....
.. Indicates: $456 \ 12 \ 23$ **u Hexadecimal Values** ...

.....
.....
.. Indicates: $0ABCDEF1(16)$, which equals $180150001(10)$ **u Degrees/Minutes/Seconds**

.....
.....
.. Indicates: $12^\circ 34' 56.78''$ · In addition to the above, this calculator also uses other indicators or symbols, which are described in each applicable section of this manual as they come up. **3. Inputting and Editing Calculations** **k Inputting Calculations** When you are ready to input a calculation, first press **A** to clear the display. Next, input your calculation formulas exactly as they are written, from left to right, and press **w** to obtain the result. Example $2 + 3 \ 4 + 10 =$ **Ac+d-e+baw** **k Editing Calculations** Use the **d** and **e** keys to move the cursor to the position you want to change, and then perform one of the operations described below. After you edit the calculation, you can execute it by pressing **w**. Or you can use **e** to move to the end of the calculation and input more.

· You can select either insert or overwrite for input*1. With overwrite, text you input replaces the text at the current cursor location. You can toggle between insert and overwrite by performing the operation: **!D(INS)**. The cursor appears as " " for insert and as " " for overwrite. *1 Insert and overwrite switching is possible only when the Linear input/output mode (page 1-32) is selected. **1-7 u To change a step** Example To change $\cos 60$ to $\sin 60$ **Acga ddd D s u To delete a step** Example To change $369 \times \times 2$ to 369×2 **Adgj*c dD** In the insert mode, the **D** key operates as a backspace key. **u To insert a step** Example To change 2.362 to $\sin 2.362$ **Ac.dgx dddddd s k Parentheses** Colors during Calculation Formula Input Parentheses are color coded during input and editing of calculation formulas in order to make it easier to confirm the proper relationship between opening and closing parentheses.

The following rules are applied when assigning parentheses colors. · When there are nested parentheses, colors are assigned in sequence from the outermost parentheses inward. Colors are assigned in the following sequence: blue, red, green, magenta, black. When there are more than five nesting levels, the color sequence is repeated starting from blue again. **1-8 · Inputting a closing parenthesis** assigns it the same color as the corresponding opening parenthesis.

· The parentheses of parenthetical expressions that are of the same level are the same color. Executing a calculation causes the color of all parentheses to become black. **k Using Replay Memory** The last calculation performed is always stored into replay memory. You can recall the contents of the replay memory by pressing **d** or **e**. If you press **e**, the calculation appears with the cursor at the beginning.

Pressing **d** causes the calculation to appear with the cursor at the end. You can make changes in the calculation as you wish and then execute it again. · **Replay memory is enabled in the Linear input/output mode only. In the Math input/output mode, the history function is used in place of replay memory. For details, see "History Function" (page 1-21).** Example **1** To perform the following two calculations $4.12 \times 6.4 = 26.368$ $4.12 \times 7.$

$1 = 29.252$ **Ae.bc*g.ew dddd !D(INS) h.b w** **1-9** After you press **A**, you can press **f** or **c** to recall previous calculations, in sequence from the newest to the oldest (**Multi-Replay Function**). Once you recall a calculation, you can use **e** and **d** to move the cursor around the calculation and make changes in it to create a new calculation. Example **2** **Abcd+efgw cde-fghw A f** (One calculation back) **f** (Two calculations back) · A calculation remains stored in replay memory until you perform another calculation. · The contents of replay memory are not cleared when you press the **A** key, so you can recall a calculation and execute it even after pressing the **A** key. **k Making Corrections in the Original Calculation** Example $14 \div 0 \times 2.3$ entered by mistake for $14 \div 10 \times 2.$

3 Abe/a*c.d w Press J. Cursor is positioned automatically at the location of the cause of the error. Make necessary changes. **db** Execute again. **w** **1-10 k Using the Clipboard for Copy and Paste** You can copy (or cut) a function, command, or other input to the clipboard, and then paste the clipboard contents at another location. Note In the Math input/output mode, the copy (or cut) range you can specify is limited by the range of movement of the cursor. In the case of parentheses, you can select any range within a parenthetical expression or you can select the entire parenthetical expression. **u To specify the copy range** **1.** Move the cursor () to the beginning or end of the range of text you want to copy and then press **!(CLIP)**.

· This will cause to appear in the status bar. **2.** Use the cursor keys to move the cursor and highlight the range of text you want to copy. **3.** Press **I(COPY)** to copy the highlighted text to the clipboard, and exit the copy range specification mode. The selected characters are not changed when you copy them. To cancel text highlighting without performing a copy operation, press **J.** **u To cut the text** **1.** Move the cursor () to the beginning or end of the range of text you want to cut and then press **!(CLIP)**. · This will cause to appear in the status bar.

2. Use the cursor keys to move the cursor and highlight the range of text you want to cut.



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3. Press 2(CUT) to cut the highlighted text to the clipboard. Cutting causes the original characters to be deleted. 1-11 u Pasting Text Move the cursor to the location where you want to paste the text, and then press !j(PASTE). The contents of the clipboard are pasted at the cursor position. A !j(PASTE) k Catalog Function The Catalog is an alphabetic list of all the commands available on this calculator. You can input a command by calling up the Catalog and then selecting the command you want. u To use the Catalog to input a command 1.

Press !e(CATALOG) to display an alphabetic Catalog of commands. · The screen that appears first is the last one you used for command input. 2. Press 6(CAT) to display the category list. · You can skip this step and go straight to step 5, if you want.

3. Use the cursor keys (f, c) to highlight the command category you want, and then press I(EXE) or w. · This displays a list of commands in the category you selected. 4. Input the first letter of the command you want to input.

This will display the first command that starts with that letter. 5. Use the cursor keys (f, c) to highlight the command you want to input, and then press I(INPUT) or w. Example To use the Catalog to input the Cash_IRR(command A!e(CATALOG)I(C)c~cw Pressing J or !J(QUIT) closes the Catalog. 1-12 4.

Using the Math Input/Output Mode Selecting "Math" for the "Input/Output" mode setting on the Setup screen (page 1-32) turns on the Math input/output mode, which allows natural input and display of certain functions, just as they appear in your textbook. · The operations in this section all are performed in the Math input/output mode. The initial default setting for this calculator is the Math input/output mode. If you have changed to the Linear input/output mode, switch back to the Math input/output mode before performing the operations in this section. See "Using the Setup Screen" (page 1-32) for information about how to switch modes.

· In the Math input/output mode, all input is insert mode (not overwrite mode) input. Note that the !D(INS) operation (page 1-7) you use in the Linear input/output mode to switch to insert mode input performs a completely different function in the Math input/output mode. For more information, see "Using Values and Expressions as Arguments" (page 1-17). · Unless specifically stated otherwise, all operations in this section are performed in the Run-Matrix mode. k Input Operations in the Math Input/Output Mode u Math Input/Output Mode Functions and Symbols The functions and symbols listed below can be used for natural input in the Math input/output mode. The "Bytes" column shows the number of bytes of memory that are used up by input in the Math input/output mode. Function/Symbol Fraction (Improper) Mixed Fraction*1 Power Square Negative Power (Reciprocal) ' Cube Root Power Root v !v(&) M x !(x 1) !x(') !((3') !M(x') !I(ex) !l(10x) (Input from MATH menu*2) (Input from MATH menu*2) (Input from MATH menu*) (Input from MATH menu*2) (Input from MATH menu*2) (Input from MATH menu*2) (Input from MATH menu*) 2 2 Key Operation Bytes 9 14 4 4 5 6 9 9 6 6 7 6 7 7 8 11 14*5 ex 10x log(a,b) Abs (Absolute Value) First Derivative Second Derivative Integral*3 Calculation*4 Matrix 1-13 Function/Symbol Parentheses Braces (Used during list input.) Brackets (Used during matrix input.) Key Operation (and) !*({) and !(/) !+([) and !-(]) Bytes 1 1 1 *1 Mixed fraction is supported in the Math input/output mode only. *2 For information about function input from the MATH function menu, see "Using the MATH Menu" described below.

*3 Tolerance cannot be specified in the Math input/output mode. If you want to specify tolerance, use the Linear input/output mode. *4 For calculation in the Math input/output mode, the pitch is always 1. If you want to specify a different pitch, use the Linear input/output mode. *5 This is the number of bytes for a 2 × 2 matrix.

u Using the MATH Menu In the Run-Matrix mode, pressing 4(MATH) displays the MATH menu. You can use this menu for natural input of matrices, derivatives, integrals, etc. · {MAT} ...

{displays the MAT submenu, for natural input of matrices} · {2×2} ... {inputs a 2 × 2 matrix} · {3×3} ... {inputs a 3 × 3 matrix} · {m×n} ... {inputs a matrix with m lines and n columns (up to 6 × 6)} · {logab} .

.. {starts natural input of logarithm logab} · {Abs} ... {starts natural input of absolute value |X|} d f(x) x = a} dx d2 · {d2/dx2} ... {starts natural input of second derivative 2 f(x)x = a} dx b · {dx} ..

· {starts natural input of integral a f(x)dx} · {d/dx} ... {starts natural input of first derivative · {f} .

.. {starts natural input of calculation x= f(x) } 1-14 u Math Input/Output Mode Input Examples This section provides a number of different examples showing how the MATH function menu and other keys can be used during Math input/output mode natural input. Be sure to pay attention to the input cursor position as you input values and data. Example 1 To input $23 + 1$ AcM d e +b w Example 2 To input $1 + A(b + v (2 5) 2 cc f e) x w$ 1-15 1 Example 3 To input $1 + 0 x + 1 dx Ab + 4(MATH)6(g)I(dx) v + b ea fb e w$ Example 4 To input $2 \times 1 2 2 2 1 2 Ac^4(MATH)I(MAT)I(2 \times 2) vbcc ee !x(')ce e!x(')ceevbcc w$ 1-16 u When the calculation does not fit within the display window Arrows appear at the left, right, top, or bottom edge of the display to let you know when there is more of the calculation off the screen in the corresponding direction.

When you see an arrow, you can use the cursor keys to scroll the screen contents and view the part you want. u Math Input/Output Mode Input Restrictions Certain types of expressions can cause the vertical width of a calculation formula to be greater than one display line. The maximum allowable vertical width of a calculation formula is about two display screens. You cannot input any expression that exceeds this limitation. u Using Values and Expressions as Arguments A value or an expression that you have already input can be used as the argument of a function. After you have input "(2+3)", for example, you can make it the argument of ', resulting in (2+3). Example 1. Move the cursor so it is located directly to the left of the part of the expression that you want to become the argument of the function you will insert. 2. Press !D(INS).

· This changes the cursor to an insert cursor (). 3. Press !x(') to insert the ' function. · This inserts the ' function and makes the parenthetical expression its argument. As shown above, the value or expression to the right of the cursor after !D(INS) are pressed becomes the argument of the function that is specified next.



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The range encompassed as the argument is everything up to the first open parenthesis to the right, if there is one, or everything up to the first function to the right ($\sin(30)$, $\log_2(4)$, etc.). 1-17 This capability can be used with the following functions. Function Improper Fraction Power ' Cube Root Power Root $\sqrt[n]{M}$ $!(x^y)$ $!(3^y)$ $!M(x^y)$ $!(ex)$ $!(10x)$ 4(MATH)2(logab) 4(MATH)3(Abs) 4(MATH)4(d/dx) 4(MATH)5(d²/dx²) 4(MATH)6(g) 1(dx) 4(MATH)6(g) 2(() Key Operation Original Expression After Insertion ex 10x log(a,b) Absolute Value First Derivative Second Derivative Integral Calculation · In the Linear input/output mode, pressing !D(INS) will change to the insert mode. See page 1-7 for more information.

u Editing Calculations in the Math Input/Output Mode The procedures for editing calculations in the Math input/output mode are basically the same as those for the Linear input/output mode. For more information, see "Editing Calculations" (page 1-7). Note however, that the following points are different between the Math input/output mode and the Linear input/output mode. · Overwrite mode input that is available in the Linear input/output mode is not supported by the Math input/output mode. In the Math input/output mode, input is always inserted at the current cursor location.

· In the Math input/output mode, pressing the D key always performs a backspace operation. 1-18 · Note the following cursor operations you can use while inputting a calculation with Math input/output mode. To do this: Move the cursor from the end of the calculation to the beginning Move the cursor from the beginning of the calculation to the end Press this key: e d k Using Undoing and Redoing Operations You can use the following procedures during calculation expression input in the Math input/output mode (up until you press the w key) to undo the last key operation and to redo the key operation you have just undone. - To undo the last key operation, press: aD(UNDO). - To redo a key operation you have just undone, press: aD(UNDO) again.

· You also can use UNDO to cancel an A key operation. After pressing A to clear an expression you have input, pressing aD(UNDO) will restore what was on the display before you pressed A. · You also can use UNDO to cancel a cursor key operation. If you press e during input and then press aD(UNDO), the cursor will return to where it was before you pressed e. · The UNDO operation is disabled while the keyboard is alpha-locked. Pressing aD(UNDO) while the keyboard is alpha-locked will perform the same delete operation as the D key alone. Example $b+vbe$ D aD(UNDO) c A aD(UNDO) 1-19 k Math Input/Output Mode Calculation Result Display Fractions, matrices, and lists produced by Math input/output mode calculations are displayed in natural format, just as they appear in your textbook. Sample Calculation Result Displays · Fractions are displayed either as improper fractions or mixed fractions, depending on the "Frac Result" setting on the Setup screen. For details, see "Using the Setup Screen" (page 1-32). · Matrices are displayed in natural format, up to 6×6 .

A matrix that has more than six rows or columns will be displayed on a MatAns screen, which is the same screen used in the Linear input/output mode. · Lists are displayed in natural format for up to 20 elements. A list that has more than 20 elements will be displayed on a ListAns screen, which is the same screen used in the Linear input/output mode. · Arrows appear at the left, right, top, or bottom edge of the display to let you know when there is more data off the screen in the corresponding direction. You can use the cursor keys to scroll the screen and view the data you want. · Pressing 2(DELETE)1(DEL-LINE) while a calculation result is selected will delete both the result and the calculation that produced it. · The multiplication sign cannot be omitted immediately before an improper fraction or mixed fraction. Be sure to always input a multiplication sign in this case. 2 Example: 2×5 c*cvf · A M, x, or !(x1) key operation cannot be followed immediately by another M, x, or !(x1) key operation. In this case, use parentheses to keep the key operations separate.

Example: (32)1 (dx)!(x1) 1-20 k History Function The history function maintains a history of calculation expressions and results in the Math input/output mode. Up to 30 sets of calculation expressions and results are maintained. b+cw *cw You can also edit the calculation expressions that are maintained by the history function and recalculate. This will recalculate all of the expressions starting from the edited expression. Example To change "1+2" to "1+3" and recalculate Perform the following operation following the sample shown above.

ffffdDdw · You can get a rough idea of how many entries (calculation expressions and results) are contained in history by checking the length of the scroll bar. A shorter bar indicates a greater number of entries. · The value stored in the answer memory is always dependent on the result produced by the last calculation performed. If history contents include operations that use the answer memory, editing a calculation may affect the answer memory value used in subsequent calculations. - If you have a series of calculations that use the answer memory to include the result of the previous calculation in the next calculation, editing a calculation will affect the results of all the other calculations that come after it.

- When the first calculation of the history includes the answer memory contents, the answer memory value is "0" because there is no calculation before the first one in history. 1-21 k Calculation Operations in the Math Input/Output Mode This section introduces Math input/output mode calculation examples. · For details about calculation operations, see "Chapter 2 Manual Calculations". u Performing Function Calculations Using Math Input/Output Mode Example 6

$=3 \ 4 \times 5 \ 10 \ \cos = 1$ (Angle: Rad) 3 2 A6v4*5w Ac(!E)(v3e)w A4(MATH)2(logab) 2e8w A!M(x') 7e123w A2+3*!M(x') 3e64e-4w A4(MATH)3(Abs)l3v4w A2v5e+3!v(!e4w A1.5+2.3!a(i)wM A4(MATH)4(d/dx)vM3e+4 vx+v-6e3w A4(MATH)6(g)1(dx) 2vx+3v+4e1 e5w A4(MATH)6(g)2(a,(K)x-3a,(K)+5ea,(K)e2e6w Operation () $\log_2 8 = 3 \ 7 \ 123 = 1.988647795 \ 2 + 3 \times 3 \ 64 - 4 = 10 \ \log 3 = 0.1249387366 \ 4 \ 2 + 3 \ 1 = 73 \ 5 \ 4 \ 20 \ 1.5 + 2.3i = 3 + 23 \ i \ 2 \ 10 \ d3 \ 2 \ dx \ (x + 4x + x - 6) \ x = 3 = 52 \ 2x \ 5 \ 1 \ 6 \ k=2 \ 2 + 3x + 4dx = 404 \ 3 - 3k + 5 = 55 \ (k \ 2) \ 1-22 \ k$ Performing Matrix Calculations Using Math Input/Output Mode u To specify the dimensions (size) of a matrix 1.

In the Run-Matrix mode, press !m(SET UP)1(Math)J. 2. Press 4(MATH) to display the MATH menu. 3. Press 1(MAT) to display the following menu.



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· {2×2} ... {inputs a 2 × 2 matrix} · {3×3} ..
 · {inputs a 3 × 3 matrix} · {m×n} ... {inputs an m-row × n-column matrix (up to 6 × 6)} Example To create a 2-row × 3-column matrix 3(m×n) Specify the number of rows.
 cw Specify the number of columns. dw w 1-23 u To input cell values Example To perform the calculation shown below 1 1 33 2 ×8 13 5 6 4 The following operation is a continuation of the example calculation on the previous page. bebvceedde bdveeefege *iw u To assign a matrix created using Math input/output mode to a specified matrix memory Example To assign the calculation result to Mat J !c(Mat)!-(Ans)a !c(Mat)a(J)w · Pressing the D key while the cursor is located at the top (upper left) of the matrix will delete the entire matrix. D 1-24 k Using Graph Modes and the Equation Mode in the Math Input/Output Mode
 Using the Math input/output mode with any of the modes below lets you input numeric expressions just as they are written in your text book and view calculation results in natural display format. Modes that support input of expressions as they are written in textbooks: Run-Matrix, eActivity, Graph, Dyna Graph, Table, Recursion, Equation (SOLVER) Modes that support natural display format: Run-Matrix, eActivity, Equation The following explanations show Math input/output mode operations in the Graph, Dyna Graph, Table, Recursion and Equation modes, and natural calculation result display in the Equation mode.
 · See the sections that cover each calculation for details about its operation. · See "Input Operations in the Math Input/Output Mode" (page 1-13) and "Calculation Operations in the Math Input/Output Mode" (page 1-22) for details about Math input/output mode input operations and calculation result displays in the Run-Matrix mode. · eActivity mode input operations and result displays are the same as those in the Run-Matrix mode. For information about eActivity mode operations, see "Chapter 10 eActivity". u Math Input/Output Mode Input in the Graph Mode You can use the Math input/output mode for graph expression input in the Graph, Dyna Graph, Table, and Recursion modes. Example 1 x x In the Graph mode, input the function $y = 2 - 2 - 1$ and then graph it. " Make sure that initial default settings are configured on the View Window. 2 mGraphv xv!x(')c ee-vv!x(')cee -bw 6(DRAW) 1-25 Example 2 x l In the Graph mode, input the function $y = x^2 - 1$ and then graph it. Make sure that initial default settings are configured on the View Window. mGraphK2(CALC)3(dx) bveevx-bvce v-beaevw 6(DRAW) · Math Input/Output Mode Input and Result Display in the Equation Mode You can use the Math input/output mode in the Equation mode for input and display as shown below.
 · In the case of simultaneous equations (1(SIMUL)) and high-order equations (2(POLY)), solutions are output in natural display format (fractions, ', and displayed in natural format) whenever possible. · In the case of Solver (3(SOLVER)), you can use Math input/output mode natural input. Example To solve the quadratic equation $x^2 + 3x + 5 = 0$ in the Equation mode mEquation!m(SET UP) cccc(Complex Mode) 2(a+bi)J 2(POLY)1(2)bwdfwfw 1-26 5. Option (OPTN) Menu The option menu gives you access to scientific functions and features that are not marked on the calculator's keyboard. The contents of the option menu differ according to the mode you are in when you press the K key. · The option menu does not appear if you press K while binary, octal, decimal, or hexadecimal is set as the default number system. · For details about the commands included on the option (OPTN) menu, see the "K key" item in the "Program Mode Command List" (page 8-51). · The meanings of the option menu items are described in the sections that cover each mode. The following list shows the option menu that is displayed when the Run-Matrix or Program mode is selected. · {LIST} .
 .. {list function menu} · {MAT} ...
 {matrix operation menu} · {COMPLEX} ... {complex number calculation menu} · {CALC} ..
 {functional analysis menu} · {STAT} ... {menu for paired-variable statistical estimated value, distribution, standard deviation, variance, and test functions} · {CONVERT} ... {metric conversion menu} * · {HYPERBL} ...
 {hyperbolic calculation menu} · {PROB} ... {probability/distribution calculation menu} · {NUMERIC} ... {numeric calculation menu} · {ANGLE} ... {menu for angle/coordinate conversion, sexagesimal input/conversion} · {ENG-SYM} .
 .. {engineering symbol menu} · {PICTURE} ...
 {graph save/recall menu} · {FUNCMEM} ... {function memory menu} · {LOGIC} ..
 {logic operator menu} · {CAPTURE} ... {screen capture menu} · {FINANCE} ... {financial calculation menu} · The PICTURE, FUNCMEM and CAPTURE items are not displayed when "Math" is selected for the "Input/Output" mode setting on the Setup screen. * Metric conversion commands are supported only when the Metric Conversion add-in application is installed. 1-27 6.
 Variable Data (VARS) Menu To recall variable data, press J to display the variable data menu. {V-WIN}/{FACTOR}/{STAT}/{GRAPH}/{DYNA}/{TABLE}/{RECURSION}/{EQUATION}/ {FINANCE}/{Str} · Note that the EQUATION and FINANCE items appear for function keys (3 and 4) only when you access the variable data menu from the Run-Matrix or Program mode. · The variable data menu does not appear if you press J while binary, octal, decimal, or hexadecimal is set as the default number system. · For details about the commands included on the variable data (VARS) menu, see the "J key" item in the "Program Mode Command List" (page 8-51). u V-WIN -- Recalling V-Window values · {X}/{Y}/{T, } ...
 {x-axis menu}/{y-axis menu}/{T, menu} · {R-X}/{R-Y}/{R-T, } ...
 {x-axis menu}/{y-axis menu}/{T, menu} for right side of Dual Graph · {min}/{max}/{scale}/{dot}/{pitch} ... {minimum value}/{maximum value}/{scale}/{dot value}*1/{pitch} *1 The dot value indicates the display range (Xmax value Xmin value) divided by the screen dot pitch. The dot value is normally calculated automatically from the minimum and maximum values.
 Changing the dot value causes the maximum to be calculated automatically. u FACTOR -- Recalling zoom factors · {Xfct}/{Yfct} ... {x-axis factor}/{y-axis factor} u STAT -- Recalling statistical data · {X} .
 .. {single-variable, paired-variable x-data} · {n}/{x}/{x2}/{x}/ {sx}/{minX}/{maxX} ... {number of data}/{mean}/{sum}/{sum ^ of squares}/{population standard deviation}/{sample standard deviation}/{minimum value}/{maximum value} · {Y} ... {paired-variable y-data} · { }/{y}/{y2}/{xy}/{y}/{sy}/{minY}/{maxY} ..
 · {mean}/{sum}/{sum of squares}/{sum of products of x-data and y-data}/{population standard deviation}/{sample standard deviation}/{minimum value}/{maximum value} · {GRAPH} .



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.. {graph data menu} · {a}/{b}/{c}/{d}/{e} ... regression coefficient and polynomial coefficients · {r}/{r2} ...
{correlation coefficient}/{coefficient of determination} · {MSe} ... {mean square error} · {Q1}/{Q3} ..
{first quartile}/{third quartile} · {Med}/{Mod} ... {median}/{mode} of input data · {Start}/{Pitch} .

.. histogram {start division}/{pitch} 1-28 · {PTS} ... {summary point data menu} · {x1}/{y1}/{x2}/{y2}/{x3}/{y3} ... coordinates of summary points · {INPUT} ..

. {statistical calculation input values} $\sqrt{\frac{n}{x}/\frac{sx}{n1}/\frac{n2}{x1}/\frac{x2}{sx1}/\frac{sx2}{sp}}$... {size of sample}/{mean of sample}/ {sample standard deviation}/{size of sample 1}/{size of sample 2}/{mean of sample 1}/ {mean of sample 2}/{standard deviation of sample 1}/{standard deviation of sample 2}/ {standard deviation of sample p} · {RESULT} ... {statistical calculation output values} · {TEST} ...
{test calculation results} · {p}/{z}/{t}/{Chi}/{F}/{p1}/ {p1}/ {p2}/{df}/{se}/{r}/{r 2}/{pa}/{Fa}/{Adj}/{SSa}/{MSa}/{pb}/{Fb}/^{^^}
{Bdf}/{SSb}/{MSb}/{pab}/{Fab}/{ABdf}/{SSab}/{MSab}/{Edf}/{SSE}/{MSe} ... {p-value}/{z score}/{t score}/{2 value}/{F value}/{estimated sample proportion}/ {estimated proportion of sample 1}/ {estimated proportion of sample 2}/ {degrees of freedom}/ {standard error}/ {correlation coefficient}/ {coefficient of determination}/ {factor A p-value}/ {factor A F value}/ {factor A degrees of freedom}/ {factor A sum of squares}/ {factor A mean squares}/ {factor B p-value}/ {factor B F value}/ {factor B degrees of freedom}/ {factor B sum of squares}/ {factor B mean squares}/ {factor AB p-value}/ {factor AB F value}/ {factor AB degrees of freedom}/ {factor AB sum of squares}/ {factor AB mean squares}/ {error degrees of freedom}/ {error sum of squares}/ {error mean squares} · {INTR} ..

. {confidence interval calculation results} · {Lower}/{Upper}/ {p}/ {p1}/ {p2}/{df} ... {confidence interval lower limit}/ {confidence ^{^^} interval upper limit}/ {estimated sample proportion}/ {estimated proportion of sample 1}/ {estimated proportion of sample 2}/ {degrees of freedom} · {DIST} .

.. {distribution calculation results} · {p}/{xInv}/{x1Inv}/{x2Inv}/{zLow}/{zUp}/{tLow}/{tUp} ... {probability distribution or cumulative distribution calculation result (p-value)}/ {inverse Student-t, 2, F, binomial, Poisson, geometric or hypergeometric cumulative distribution calculation result}/ {inverse normal cumulative distribution upper limit (right edge) or lower limit (left edge)}/ {inverse normal cumulative distribution upper limit (right edge)}/ {normal cumulative distribution lower limit (left edge)}/ {normal cumulative distribution upper limit (right edge)}/ {Student-t cumulative distribution lower limit (left edge)}/ {Student-t cumulative distribution upper limit (right edge)} u GRAPH -- Recalling graph functions · {Y}/{r} ... {rectangular coordinate function (Y=f(x) type)}/ {polar coordinate function} · {Xt}/{Yt} ..

. parametric graph function {Xt}/{Yt} · {X} ... {rectangular coordinate function (X=f(y) type)} · Press these keys before inputting a value to specify a memory area. u DYNA -- Recalling dynamic graph setup data · {Start}/{End}/{Pitch} ... {coefficient range start value}/ {coefficient range end value}/ {coefficient value increment} 1-29 u TABLE -- Recalling table setup and content data · {Start}/{End}/{Pitch} ..

. {table range start value}/ {table range end value}/ {table value increment} · {Result*1} ... {matrix of table contents} *1 The Result item appears only when the TABLE menu is displayed in the Run-Matrix and Program modes.
u RECURSION -- Recalling recursion formula*1, table range, and table content data · {FORMULA} ... {recursion formula data menu} ·
{an}/{an+1}/{an+2}/{bn}/{bn+1}/{bn+2}/{Cn}/{Cn+1}/{Cn+2} ..
. {an}/{an+1}/{an+2}/{bn}/{bn+1}/{bn+2}/{cn}/ {cn+1}/{cn+2} expressions · {RANGE} ... {table range data menu} · {Start}/{End} ... table range {start value}/ {end value} · {a0}/{a1}/{a2}/{b0}/{b1}/{b2}/{C0}/{C1}/{C2} ...

{a0}/{a1}/{a2}/{b0}/{b1}/{b2}/{c0}/{c1}/{c2} value · {anStart}/{bnStart}/{CnStart} ... origin of {an}/{bn}/{cn} recursion formula convergence/ divergence graph (WEB graph) · {Result*2} ... {matrix of table contents*3} *1 An error occurs when there is no function or recursion formula numeric table in memory.
*2 "Result" is available only in the Run-Matrix and Program modes. *3 Table contents are stored automatically in Matrix Answer Memory (MatAns). u EQUATION -- Recalling equation coefficients and solutions*1 *2 · {SimRes}/{SimCoef} .
.. matrix of {solutions}/ {coefficients} for linear equations with two through six unknowns*3 · {PlyRes}/{PlyCoef} ...
matrix of {solution}/ {coefficients} for high-order equations from 2nd to 6th degree *1 Coefficients and solutions are stored automatically in Matrix Answer Memory (MatAns). *2 The following conditions cause an error. - When there are no coefficients input for the equation - When there are no solutions obtained for the equation * Coefficient and solution memory data for a linear equation cannot be recalled at the same time. 3 u FINANCE -- Recalling financial calculation data · {n}/{I%}/{PV}/{PMT}/{FV} ..
. {payment periods (installments)}/ {annual interest rate}/ {present value}/ {payment}/ {future value} · {P/Y}/{C/Y} ... {installment periods per year}/ {compounding periods per year} u Str -- Str command · {Str} ... {string memory} 1-30 7. Program (PRGM) Menu To display the program (PRGM) menu, first enter the Run-Matrix or Program mode from the Main Menu and then press !J(PRGM). The following are the selections available in the program (PRGM) menu.

. The program (PRGM) menu items are not displayed when "Math" is selected for the "Input/ Output" mode setting on the Setup screen. · {COMMAND}
.....{program command menu} · {CONTROL}
..{program control command menu} · {JUMP} ...
.....
.....{jump command menu} · {?} ...
.....
.....
....{input command} · {^} .
.....
.....{output command} · {CLEAR} .
.....
.....
..{clear command menu} · {DISPLAY}{display command menu} · {RELATNL} .
.....{conditional jump relational operator menu} · {I/O}
.....
.....

.....{I/O control/transfer command menu} · {:}

.....

.....

...{multi-statement command} · {STR} ..

.....

.....{string command} The following function key menu appears if you press !J(PRGM) in the Run-Matrix mode or the Program mode while binary, octal, decimal, or hexadecimal is set as the default number system. · {Prog}

.....

.....

...{program recall} · {JUMP}/{?}/{^}/{RELATNL}/{:} The functions assigned to the function keys are the same as those in the Comp mode. For details on the commands that are available in the various menus you can access from the program menu, see "Chapter 8 Programming". 1-31 8. Using the Setup Screen The mode's Setup screen shows the current status of mode settings and lets you make any changes you want.



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The following procedure shows how to change a setup. u To change a mode setup 1. Select the icon you want and press w to enter a mode and display its initial screen.

Here we will enter the Run-Matrix mode. 2. Press !m(SET UP) to display the mode's Setup screen. · This Setup screen is just one possible example. Actual Setup screen contents will differ according to the mode you are in and that mode's current settings. 3. Use the f and c cursor keys to move the highlighting to the item whose setting you want to change. 4. Press the function key (1 to 6) that is marked with the setting you want to make. 5.

After you are finished making any changes you want, press J to exit the Setup screen. k Setup Screen Function Key Menus This section details the settings you can make using the function keys in the Setup screen. indicates default setting. · The setting of each item with a frame around it is indicated by an icon in the status bar. u Input/Output (input/output mode) · {Math}/{Line} .

.. {Math}/{Linear} input/output mode u Mode (calculation/binary, octal, decimal, hexadecimal mode) · {Comp} ...

{arithmetic calculation mode} · {Dec}/{Hex}/{Bin}/{Oct} ... {decimal}/{hexadecimal}/{binary}/{octal} u Frac Result (fraction result display format) · {d/c}/{ab/c} ... {improper}/{mixed} fraction 1-32 u Func Type (graph function type) Pressing one of the following function keys also switches the function of the v key. · {Y=}/{r=}/{Parm}/{X=} ...

{rectangular coordinate (Y= f(x) type)}/{polar coordinate}/{parametric}/{rectangular coordinate (X= f(y) type)} graph · {Y>}/{Y<}/{Yt}/{Ys} ... {y>f(x)}/{y<f(x)}/{yf(x)}/{yf(x)} inequality graph · {X>}/{X<}/{Xt}/{Xs} ... {x>f(y)}/{x<f(y)}/{xf(y)}/{xf(y)} inequality graph u Draw Type (graph drawing method) · {Connect}/{Plot} ... {connected points}/{unconnected points} u Derivative (derivative value display) · {On}/{Off} .
.. {display on}/{display off} while Graph-to-Table, Table & Graph, and Trace are being used u Angle (default angle unit) · {Deg}/{Rad}/{Gra} ... {degrees}/{radians}/{grads} u Complex Mode · {Real} ... {calculation in real number range only} · {a+bi}/{r} ..
· {rectangular format}/{polar format} display of a complex calculation u Coord (graph pointer coordinate display) · {On}/{Off} ... {display on}/{display off} u Grid (graph gridline display) · {On}/{Off}/{Line} ... {show grid as dots}/{hide grid}/{show grid as lines} u Axes (graph axis display) · {On}/{Off}/{Scale} ...

{show axis}/{hide axis}/{show axis and scale} u Label (graph axis label display) · {On}/{Off} ... {display on}/{display off} u Display (display format) · {Fix}/{Sci}/{Norm}/{Eng} ... {fixed number of decimal places specification}/{number of significant digits specification}/{normal display setting}/{engineering mode} · When the Engineering mode is on, "E" is appended after the status bar icon, such as . u Stat Wind (statistical graph V-Window setting method) · {Auto}/{Manual} ...

{automatic}/{manual} u Resid List (residual calculation) · {None}/{LIST} ... {no calculation}/{list specification for the calculated residual data} 1-33 u List File (list file display settings) · {FILE} ..
· {settings of list file on the display} u Sub Name (list naming) · {On}/{Off} ... {display on}/{display off} u Graph Func (function display during graph drawing and trace) · {On}/{Off} .

.. {display on}/{display off} u Dual Screen (dual screen mode status) · {G+G}/{GtoT}/{Off} ... {graphing on both sides of dual screen}/{graph on one side and numeric table on the other side of dual screen}/{dual screen off} u Simul Graph (simultaneous graphing mode) · {On}/{Off} ... {simultaneous graphing on (all graphs drawn simultaneously)}/{simultaneous graphing off (graphs drawn in area numeric sequence)} u Background (background image display) · {None}/{PICT n}/{OPEN}..

· {no background}/{specify picture memory image as the background}/{specify an image as the background} u Plot/LineCol (plot and line color) · {Black}/{Blue}/{Red}/{Magenta}/{Green}/{Cyan}/{Yellow}... Specifies a color for plots and graph lines. u Sketch Line (overlaid line type) · { } / { } / { } / { } ... {normal}/{thick}/{broken}/{dotted}/{thin} u Dynamic Type (dynamic graph type) · {Cont}/{Stop} ..
· {non-stop (continuous)}/{automatic stop after 10 draws} u Locus (dynamic graph locus mode) · {On}/{Off} ... {locus drawn}/{locus not drawn} u Y=Draw Speed (dynamic graph draw speed) · {Norm}/{High} .
.. {normal}/{high-speed} u Variable (table generation and graph draw settings) · {RANG}/{LIST} ...

{use table range}/{use list data} u Display (value display in recursion table) · {On}/{Off} ... {display on}/{display off} 1-34 u Slope (display of derivative at current pointer location in conic section graph) · {On}/{Off} ... {display on}/{display off} u Payment (payment period setting) · {BEGIN}/{END} ... {beginning}/{end} setting of payment period u Date Mode (number of days per year setting) · {365}/{360} .

.. interest calculations using {365}/{360} days per year u Periods/YR. (payment interval specification) · {Annual}/{Semi} ... {annual}/{semiannual} u Graph Color · {Black}/{Blue}/{Red}/{Magenta}/{Green}/{Cyan}/{Yellow} ... Specifies a single line color for graphing in the Financial mode.

u Ineq Type (inequality fill specification) · {Intsect}/{Union} ... When graphing multiple inequalities, {fill areas where all inequality conditions are satisfied}/{fill areas where each inequality condition is satisfied} u Simplify (calculation result auto/manual reduction specification) · {Auto}/{Manual} ..
· {auto reduce and display}/{display without reduction} u Q1Q3 Type (Q1/Q3 calculation formulas) · {Std}/{OnData} ... {divide total population on its center point between upper and lower groups, with the median of the lower group Q1 and the median of the upper group Q3}/ {make the value of element whose cumulative frequency ratio is greater than 1/4 and nearest to 1/4 Q1 and the value of element whose cumulative frequency ratio is greater than 3/4 and nearest to 3/4 Q3} u Auto Calc (spreadsheet auto calc) · {On}/{Off} .

.. {execute}/{not execute} the formulas automatically u Show Cell (spreadsheet cell display mode) · {Form}/{Val} ... {formula}*1/{value} u Move (spreadsheet cell cursor direction)*2 · {Low}/{Right} ... {move down}/{move right} *1 Selecting "Form" (formula) causes a formula in the cell to be displayed as a formula. The "Form" does not affect any non-formula data in the cell.

*2 Specifies the direction the cell cursor moves when you press the w key to register cell input, when the Sequence command generates a number table, and when you recall data from List memory.



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1-35 9. Using Screen Capture Any time while operating the calculator, you can capture an image of the current screen and save it in capture memory. u To capture a screen image 1. Operate the calculator and display the screen you want to capture. 2. Press !h(CAPTURE). · This displays a memory area selection dialog box. 3. Input a value from 1 to 20 and then press w.

· This will capture the screen image and save it in capture memory area named "Capt n" (n = the value you input). · You cannot capture the screen image of a message indicating that an operation or data communication is in progress. · A Memory ERROR will occur if there is not enough room in main memory to store the screen capture. u To recall a screen image from capture memory This operation is possible only while the Linear input/output mode is selected. 1. In the Run-Matrix mode, press K6(g) 6(g)5(CAPTURE)1(Recall). 2. Enter a capture memory number in the range of 1 to 20, and then press w. · This displays the image stored in the capture memory you specified. 3.

To exit the image display and return to the screen you started from in step 1, press J. · You can also use the RclCapt command in a program to recall a screen image from capture memory. 1-36 10. When you keep having problems... If you keep having problems when you are trying to perform operations, try the following before assuming that there is something wrong with the calculator. k Getting the Calculator Back to its Original Mode Settings 1. From the Main Menu, enter the System mode. 2.

Press 5(RESET). 3. Press 1(SETUP), and then press I(Yes). 4. Press Jm to return to the Main Menu. Now enter the correct mode and perform your calculation again, monitoring the results on the display. k Restart and Reset u Restart Should the calculator start to act abnormally, you can restart it by pressing the RESTART button. Note, however, that you should only use the RESTART button only as a last resort. Normally, pressing the RESTART button reboots the calculator's operating system, so programs, graph functions and other data in calculator memory is retained. RESTART button Important! The calculator backs up user data (main memory) when you turn power off and loads the backed up data when you turn power back on.

When you press the RESTART button, the calculator restarts and loads backed up data. This means that if you press the RESTART button after you edit a program, graph function, or other data, any data that has not been backed up will be lost. Note Pressing the RESTART button to restart the calculator will cause the Battery Settings screen to appear on the display. For details about the settings on this screen, see "Battery Settings" (page 12-6). 1-37 u Reset Use reset when you want to delete all data currently in calculator memory and return all mode settings to their initial defaults.

Before performing the reset operation, first make a written copy of all important data. For details, see "Reset" (page 12-4). k Low Battery Message If the following message appears on the display, immediately turn off the calculator and replace batteries as instructed. If you continue using the calculator without replacing batteries, power will automatically turn off to protect memory contents. Once this happens, you will not be able to turn power back on, and there is the danger that memory contents will be corrupted or lost entirely.

· You will not be able to perform data communication operations after the low battery message appears. k Image File Compatibility An image file (g3p/g3b) saved (or updated) on the fx-CG20 will not be compatible with the fx-CG10. · "To capture a screen image" (page 1-36) · "To update the background image V-Window settings with current V-Window settings" (page 5-11) · "Adjusting the Lightness (Fade I/O) of the Background Image" (page 5-12) · "Saving Graph Screen Contents as an Image (g3p File)" (page 5-21) · "Saving Current Screen Contents as an Image (g3p File) in the Geometry Mode" (page 14-9) · "Saving a File" (page 15-5) · "K1(PICTURE)" under "Graph Screen Key Operations" (page -39) · Other image files saved from the graph screen of any mode (Statistics, Spreadsheet, Financial, etc.) 1-38 Note · The fx-CG10 will not be able to import image files saved using the above procedures on the fx-CG20. · The fx-CG20 will be able to read image files saved using the above procedures on the fxCG10. · eActivity files that contain inserted images that were stored (or updated) on the fx-CG20 cannot be opened with the fx-CG10. · If the message "Provided by CASIO" appears at the bottom of the detail screen of an image file or eActivity file that was displayed using the operation under "Viewing Detailed Information about a File in Storage Memory" (page 11-6), that file can be opened on both the fx-CG10 and the fx-CG20. 1-39 Chapter 2 Manual Calculations 1. Basic Calculations k Arithmetic Calculations · Enter arithmetic calculations as they are written, from left to right. · Use the - key to input the minus sign before a negative value.

· Calculations are performed internally with a 15-digit mantissa. The result is rounded to a 10digit mantissa before it is displayed. · For mixed arithmetic calculations, multiplication and division are given priority over addition and subtraction. Example $56 \times (12) \div (2.5) = 268.8$ $(2 + 3) \times 102 = 500$ $2 + 3 \times (4 + 5) = 29$ Operation $56 \times 12 / 2.5 w (2+3) * 1E2 w 2+3*(4+5w * 1 \$6c4*5w <Linear input/output mode> 6/(4*5)w 2 6 3 = (0.3) 4 \times 5 10 * 1$ Final closed parentheses (immediately before operation of the w key) may be omitted, no matter how many are required. k Number of Decimal Places, Number of Significant Digits, Normal Display Range [SET UP]- [Display] -[Fix] / [Sci] / [Norm] · Even after you specify the number of decimal places or the number of significant digits, internal calculations are still performed using a 15-digit mantissa, and displayed values are stored with a 10-digit mantissa. Use Rnd of the Numeric Calculation Menu (NUMERIC) (page 2-14) to round the displayed value off to the number of decimal place and significant digit settings.

· Number of decimal place (Fix) and significant digit (Sci) settings normally remain in effect until you change them or until you change the normal display range (Norm) setting. 2-1 Example $1 100 \div 6 = 16.66666666...$

Operation $100/6w$ Display 16.66666667 Condition 4 decimal places 5 significant digits Cancels specification !m(SET UP) ff 1(Fix)ewJw !m(SET UP) ff 2(Sci)fwJw !m(SET UP) ff 3(Norm)Jw *1 $16.6667 * 1 1.6667E+01 16.66666667 * 1$ Displayed values are rounded off to the place you specify.

Example 2 $200 \div 7 \times 14 = 400$ Operation $200/7*14w$ 3 decimal places Calculation continues using display capacity of 10 digits !m(SET UP) ff 1(Fix)dwJw $200/7w * 14w$ Display $400 400$.



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000 28.571 Ans \times 1 400.000 Condition · If the same calculation is performed using the specified number of digits: 200/7w The value stored internally is rounded off to the number of decimal places specified on the Setup screen. You can also specify the number of decimal places for rounding of internal values for a specific calculation. (Example: To specify rounding to two decimal places) K6(g)4(NUMERIC)4(Rnd)w * 14w 200/7w 6(g)1(RndFix)!-(Ans),2) w * 14w 28.571 28.571 Ans \times 1 399.994 28.571 RndFix(Ans,2) 28.

570 Ans \times 1 399.980 · You cannot use a first derivative, second derivative, integration, , maximum/minimum value, Solve, RndFix or logab calculation expression inside of a RndFix calculation term. 2-2 k Calculation Priority Sequence This calculator employs true algebraic logic to calculate the parts of a formula in the following order: 1 Type A functions · Coordinate transformation Pol (x, y), Rec (r,) · Functions that include parentheses (such as derivatives, integrations, , etc.) d/dx, d2/dx2, dx, , Solve, FMin, FMax, ListMat, Fill, Seq, SortA, SortD, Min, Max, Median, Mean, Augment, MatList, P(, Q(, R(, t(, RndFix, logab · Composite functions*1, List, Mat, fn, Yn, rn, Xtn, Ytn, Xn 2 Type B functions With these functions, the value is entered and then the function key is pressed. x2, x1, x!, ° ' ", ENG symbols, angle unit °, r, g 3 Power/root ^ (xy), x' 4 Fractions a b/c 5 Implied multiplication format in front of, memory name, or variable name. 2, 5A, Xmin, F Start, etc. 6 Type C functions With these functions, the function key is pressed and then the value is entered. ', 3', log, In, ex, 10x, sin, cos, tan, sin1, cos1, tan1, sinh, cosh, tanh, sinh1, cosh1, tanh1, (, d, h, b, o, Neg, Not, Det, Trn, Dim, Identity, Ref, Rref, Sum, Prod, Cuml, Percent, List, Abs, Int, Frac, Intg, Arg, Conjg, ReP, ImP 7 Implied multiplication format in front of Type A functions, Type C functions, and parenthesis. 2', A log2, etc. 3 8 Permutation, combination, complex number operator in polar form nPr, nCr, 9 Metric conversion commands*2 0 \times , \div , Int \div , Rmdr ! +, @ Relational operators =, >, <, # And (logical operator), and (bitwise operator) \$ Or, Xor (logical operator), or, xor, xnor (bitwise operator) *1 You can combine the contents of multiple function memory (fn) locations or graph memory (Yn, rn, Xtn, Ytn, Xn) locations into composite functions. Specifying fn1(fn2), for example, results in the composite function fn1 \circ fn2 (see page 5-14). A composite function can consist of up to five functions. 2 * Metric conversion commands are supported only when the Metric Conversion add-in application is installed. 2-3 Example 2 + 3 \times (log sin22 + 6.8) = 22. 07101691 (angle unit = Rad) 1 2 3 4 5 6 · When functions with the same priority are used in series, execution is performed from right to left. exIn 120 ex{In(120)} Otherwise, execution is from left to right. · Compound functions are executed from right to left. · Anything contained within parentheses receives highest priority. k Calculation Result Irrational Number Display You can configure the calculator to display calculation results in irrational number format (including ' or) by selecting "Math" for the "Input/Output" mode setting on the Setup screen.

Example ' + ' = 3' 2 8 2 (Input/Output: Math) !x(')ce+!x(')iw u Calculation Result Display Range with ' Display of a calculation result in ' format is supported for result with ' in up to two terms. Calculation results in ' format take one of the following forms. b e \pm a', \pm d \pm a', \pm a' \pm d' b c f · The following are the ranges for each of the coefficients (a, b, c, d, e, f) can be displayed in the ' calculation result format. 1 < a < 100, 1 < b < 1000, 1 < c < 100 0 < d < 100, 0 < e < 1000, 1 < f < 100 2-4 · In the cases shown below, a calculation result may be able to be displayed in ' format even if their coefficients (a, c, d) are outside the above ranges. A ' format calculation result uses a common denominator. b e a' + d' a'' + d'' b e c' c f * c' is the least common multiple of c and f. Since the calculation result uses a common denominator, calculation result still may be displayed using the ' format even when coefficients (a', c', d') are outside the corresponding range of coefficients (a, c, d). Example: 3 2 3 2 ' ' 10' + 11' + = 110 11 10 Calculation Examples This calculation: 2 \times (3 2' = 6 4' 5) 5 35' \times 3 = 148.492424 (= 105 ' 1 2 2)* 150' 2 = 8.485281374*1 25 23 \times (5 2' = 35.

32566285 (= 115 46' 1 3) 3)* ' + ' + ' = ' + 3' 2 3 8 3 2 2 3 6' + ' + ' = 5.595754113*2 *1 Decimal format because values are outside of range. *2 Decimal format because calculation result has three terms. · The calculation result is displayed using decimal format even if an intermediate result goes greater than two terms. Example: (1 + ' + ' (1 ' ' 2 3) 2 3) = 8.898979486 · If the calculation formula has a ' term and a term that cannot be displayed as a fraction, the calculation result will be displayed in decimal format. Example: log3 + ' = 1.891334817 2 (= 4 2' 6) Decimal format ' format Decimal format Produces this type of display: ' format Decimal format 2-5 u Calculation Result Display Range with A calculation results is displayed using format in the following cases. · When the calculation result can be displayed in the form n · When the calculation result can be displayed in the form a b or c c However, {number of a digits + number of b digits + number of c digits} must be 8 or less b b when the above a or is reduced.*1*2 Also, the maximum number of allowable c c 2 three.

*1 When c < b, the number of a, b, and c digits are counted when the fraction is converted from an improper fraction (b) to a mixed fraction (a n is an integer up to \106). c b). c *2 When "Manual" is specified for the Setup screen "Simplify" setting, the calculation result may be displayed in decimal format, even if these conditions are met. Calculation Examples This calculation: 78 \times 2 = 156 123456 \times 9 = 3490636.164 (= 11111104) *3 105 2 568 71 = 105 824 103 2 129 *4 1619 Produces this type of display: format Decimal format format Decimal format 2 258 = 6. 533503684 3238 *3 Decimal format because calculation result integer part is \106\ or greater.



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