Manual abstract:

Note that resetting the calculator will also delete all data currently stored in its memory. To reset the calculator to initial defaults 1. Press Nc3(SYSTEM)3(Reset All). · This causes the "Reset All?" confirmation message to appear. 2. Press E(Yes). · If you do not want to reset the calculator to initial defaults, press J(No) instead of E(Yes). @@@@@@@@Alternate functions are marked above the keycap. Alternate function sin1{D} Keycap function s Alternate function operations are notated in this manual as shown below. 1 Example: 1s(sin)1E The notation in parentheses indicates the function executed by the preceding key operation.

· The following shows the notation used in the manual for menu items that appear on the display. Example: z {PROG} {/} The notation in braces ({ }) indicates the menu item being selected. · The following shows the notation used in the manual for menu items that appear on the display (which are executed by pressing a number key). Example: z {MATH}1(dX) The notation in parentheses indicates the menu item accessed by the preceding number key. · The displays and illustrations (such as key markings) shown in this User's Guide are for illustrative purposes only, and may differ somewhat from the actual items they represent.

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, Ltd. shall not be liable for any claim of any kind whatsoever by any other party arising out of the use of this product and the items that come with it. · Company and product names used in this manual may be registered trademarks or trademarks of their respective owners. k Symbols Used in Examples Various symbols are used in the examples of this manual to alert you to settings that need to be configured in order to perform the example operation correctly. · A mark like the ones shown below indicates that you need to change the calculator's display format setting. If you see this: B Change the display format setting to: Natural Display If you see this: b Change the display format setting to: Linear Display For details, see "Selecting the Display Format (MthIO, LineIO)" (page 11). E-2 · A mark like the ones shown below indicates that you need to change the calculator's angle unit setting. If you see this: v Change the angle unit setting to: Deg If you see this: V Change the angle unit setting to: Rad For details, see "Specifying the Angle Unit" (page 12). Safety Precautions Be sure to read the following safety precautions before using this calculator. Be sure to keep all user documentation handy for future reference.

Caution This symbol is used to indicate information that can result in personal injury or material damage if ignored. Battery · After removing the battery from the calculator, put it in a safe place where it will not get into the hands of small children and accidentally swallowed. · Keep batteries out of the reach of small children. If accidentally swallowed, consult with a physician immediately. · Never charge the battery, try to take the battery apart, or allow the battery to become shorted. Never expose the battery to direct heat or dispose of it by incineration. · Improperly using a battery can cause it to leak and damage nearby items, and can create the risk of fire and personal injury. · Always make sure that the battery's positive k and negative l ends are facing correctly when you load it into the calculator. · Remove the battery if you do not plan to use the calculator for a long time. · Use only the type of battery specified for this calculator in this manual.

Disposing of the Calculator · Never dispose of the calculator by burning it. Doing so can cause certain components to suddenly burst, creating the risk of fire and personal injury. E-3 Operating Precautions · Be sure to press the P button on the back of the calculator before using the calculator for the first time. See page 1 for information about the P button. · Even if the calculator is operating normally, replace the battery at least once a year.

A dead battery can leak, causing damage to and malfunction of the calculator. Never leave a dead battery in the calculator. · The battery that comes with this unit discharges slightly during shipment and storage. Because of this, it may require replacement sooner than the normal expected battery life. · Do not use an oxyride battery or any other type of nickel-based primary battery with this product.

Incompatibility between such batteries and product specifications can result in shorter battery life and product malfunction. · Low battery power can cause memory contents to become corrupted or lost completely. Always keep written records of all important data. · Avoid use and storage of the calculator in areas subjected to temperature extremes. Very low temperatures can cause slow display response, total failure of the display, and shortening of battery life. Also avoid leaving the calculator in direct sunlight, near a window, near a heater or anywhere else it might be exposed to very high temperatures. Heat can cause discoloration or deformation of the calculator's case, and damage to internal circuitry. · Avoid use and storage of the calculator in areas subjected to large amounts of humidity and dust. Take care never to leave the calculator where it might be splashed by water or exposed to large amounts of humidity or dust. Such conditions can damage internal circuitry.

· Never drop the calculator or otherwise subject it to strong impact. · Never twist or bend the calculator. Avoid carrying the calculator in the pocket of your trousers or other tight-fitting clothing where it might be subjected to twisting or bending. · Never try to take the calculator apart. · Never press the keys of the calculator with a ballpoint pen or other pointed object. · Use a soft, dry cloth to clean the exterior of the calculator. If the calculator becomes very dirty, wipe it off with a cloth moistened in a weak solution of water and a mild neutral household detergent. Wring out all excess liquid before wiping the calculator. Never use thinner, benzene or other volatile agents to clean the calculator. Doing so can remove printed markings and can damage the case.

E-4 Contents Remove the insulation sheet! .....

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.. k Turning On the Calculator Press o. This displays the same screen that was on the display when you last turned off the calculator. A Adjusting Display Contrast If the figures on the display become hard to read, try adjusting display contrast. 1. Press Nc3(SYSTEM)1(Contrast). · This displays the contrast adjustment screen. 2. Use d and e to adjust display contrast.

3. After the setting is the way you want, press J. Note You can also use d and e to adjust contrast while the calculation mode menu that appears when you press the N key is on the display. A Turning Off the Calculator Press 1o(OFF). k Key Markings % BIN [Function 1 2 3 4 ln % [BIN Key Marking Color

Orange Red Green To perform the function: Press the key. Press 1 and then press the key. Press S and then press the key. In the BASE-N Mode, press the key. k Reading the Display A Input Expressions and Calculation Results This calculator can display both the expressions you input and calculation results on the same screen. E-9 Input expression Calculation result A Display Symbols The symbols described below appear on the display of the calculator to indicate the current calculation mode, the calculator setup, the progress of calculations, and more.

The nearby sample screen shows the 7 symbol. The 7 symbol turns on when degrees (Deg) are selected for the default angle unit (page 12). Calculation Modes and Setup k Selecting a Calculation Mode Your calculator has 11 "calculation modes". A Selecting a Calculation Mode 1. Press N.

· This displays the calculation mode menu. Use c and f to switch between menu screen 1 and screen 2. Screen 1 To select this calculation mode: COMP (Computation) BASE-N (Base n) SD (Single Variable Statistics) REG (Paired Variable Statistics) PROG (Programming) RECUR (Recursion) TABLE (Tables) EQN (Equations) Screen 2 Go to this screen: And press this key: 1(COMP) 2(BASE-N) 3(SD) Screen 1 4(REG) 5(PROG) 6(RECUR) 7(TABLE) 8(EQN) 2. Perform one of the following operations to select the calculation mode you want. E-10 To select this calculation mode: LINK (Communication) MEMORY (Memory Management) SYSTEM (Contrast Adjustment, Reset) Go to this screen: Screen 2 And press this key: 1(LINK) 2(MEMORY) 3(SYSTEM) · To exit the calculation mode menu without changing the calculation mode, press N.

k Calculator Setup The calculator setup can be used to configure input and output settings, calculation parameters, and other settings. The setup can be configured using setup screens, which you access by pressing 1 N(SETUP). There are two setup screens, and you can use f and c to navigate between them. A Selecting the Display Format (MthIO, LineIO) You can select either natural display (MthIO) or linear display (LineIO) for expressions you input and for calculation results. Natural Display (MthIO) Natural display displays fraction, square root, derivative, integral, exponential, logarithmic, and other mathematical expressions just as they are written. This format is applied both for input expressions and for calculation results. When natural display is selected, the result of a calculation is displayed using fraction, square root, or notation whenever possible. 1 1 For example, the calculation 1 ÷ 2 produces the result , while ÷ 3 results in . 2 3 Linear Display (LineIO) With linear display, expressions and functions are input and displayed using a special format 1 defined by your calculator. For example, would be input as 1 { 2, and log24 would be 2 input as log(2,4).

When linear display is selected all calculation results, except for fractions, are displayed using decimal values. To select this display fomat: Natural Display (MthIO) Linear Display (LineIO) Perform this key operation: 1N1(MthIO) 1N2(LineIO) Note For information about the input procedures when using the natural display and linear display, see "Inputting Calculation Expressions and Values" on page 14 of this manual and the sections of this manual that explanation of each type of calculation. E-11 A Specifying the Angle Unit To select this angle unit: Degrees Radians Grads Perform this key operation: 1N3(Deg) 1N4(Rad) 1N5(Gra) (90° = radians = 100 grads) 2 A Specifying the Display Digits To specify this display digit setting: Number of Decimal Places Significant Digits Exponential Display Range Perform this key operation: 1N6(Fix)0(0) to 9(9) 1N7(Sci)1(1) to 9(9), 0(10) 1N8(Norm)1(Norm1) or 2(Norm2) The following explains how calculation results are displayed in accordance with the setting you specify. · From zero to nine decimal places are displayed in accordance with the number of decimal places (Fix) you specify. Calculation results are rounded off to the specified number of digits. Example: 100 ÷ 7 = 14.286 (Fix = 3) 14.29 (Fix = 2) · After you specify the number of significant digits with Sci, calculation results are displayed using the specified number of significant digits and 10 to the applicable power. Calculation results are rounded off to the specified number of digits.

1 (Sci = 5) Example: 1 ÷ 7 = 1.

4286 × 10 1 (Sci = 4) 1.429 × 10 · Selecting Norm1 or Norm2 causes the display to switch to exponential notation whenever the result is within the ranges defined below. 2 10 Norm1: 10 > x , x > 10 Norm2: 10 > x , x > 10 9 10 Example: 100 ÷ 7 = 14.28571429 (Norm1 or Norm2) 3 (Norm1) 1 ÷ 200 = 5. × 10 0.

005 (Norm2) A Specifying the Fraction Display Format To specify this fraction format for display of calculation results: Mixed Fractions Improper Fractions Perform this key operation: 1Nc1(ab/c) 1Nc2(d/c) E-12 A Specifying the Engineering Symbol Setting This setting lets you turn engineering symbols on and off. For more information, see "Using Engineering Symbols" on page 54. To do this: Turn engineering symbols on Turn engineering symbols off Perform this key operation: 1Nc3(ENG)1(EngOn) 1Nc3(ENG)2(EngOff) While engineering symbols are turned on (EngOn), engineering symbols are used when a calculation result is outside of the range of 1 < x < 1000. A Specifying the Complex Number Display Format You can specify either rectangular coordinate format or polar coordinate format for complex number calculation results. To specify this complex number format for display of calculation results: Rectangular Coordinates Polar Coordinates Perform this key operation: 1Nc4(COMPLX)1(a+bi) 1Nc4(COMPLX)2(r) ENG conversion (page 53) is not possible while polar coordinate format is selected.

A Specifying the Statistical Frequency Setting Use the key operations below to turn statistical frequency on or off during SD Mode and REG Mode calculations (page 72). To select this frequency setting: Frequency On Frequency Off Perform this key operation: 1Nc5(STAT)1(FreqOn) 1Nc5(STAT)2(FreqOff) A Changing the BASE-N Mode Negative Value Setting You can use the key operations below to enable or disable use of negative values in the BASE-N Mode. To specify this setting: Negative values enabled Negative values disabled Perform this key operation: 1Nc6(BASE-N)1(Signed) 1Nc6(BASE-N)2(Unsigned) k Clearing the Calculation Mode and Setup Settings (Reset Setup) Perform the following key operation to reset the calculation mode and setup settings. Nc3(SYSTEM)2(Reset Setup)E(Yes) If you do not want to reset the calculator's settings, press J(No) in place of E(Yes) in the above operation. E-13 Calculation Mode .....

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. COMP Setup Settings Display Format .....

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..... FreqOff BASE-N Negatives .

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..... Signed Using the Function Menu The function menu provides you with access to various mathematical functions, commands, constants, symbols, and other special operations.

A Displaying the Function Menu Press z. The function menu shown below will appear if you press z while in the COMP Mode for example. A Exiting the Function Menu Press J. Inputting Calculation Expressions and Values k Inputting a Calculation Expression (Natural Input) The natural input system of your calculator lets you input a calculation expression just as it is written and execute it by pressing E. The calculator determines the proper priority sequence for addition, subtraction, multiplication, division, fractions and parentheses automatically.

Example: 2 (5 + 4) 2 × (3) = b 2(5+4)2-3E E-14 A Inputting Scientific Functions with Parentheses (sin, cos, ', etc.) Your calculator supports input of the scientific functions with parentheses shown below. Note that after you input the argument, you need to press) to close the parentheses. sin(, cos(, tan(, sin (, cos (, tan (, sinh(, cosh(, tanh(, sinh (, cosh (, tanh (, log(, ln(, 3 2 2 e^(, 10^(, '(, '(, Abs(, Pol(, Rec(, (, d/dx(, d /dx (, (, P(, Q(, R(, Arg(, Conjg(, ReP(, ImP(, Not(, Neg(, Det(, Trn(, Rnd(, Int(, Frac(, Intg(, RanInt#(Example: sin 30 = 1 1 1 1 1 1 b s30)E Note Some functions require a different input sequence when using natural input. For more information, see "Inputting Calculation Expressions Using Natural Display" on page 17.*

A Omitting the Multiplication Sign You can omit the multiplication sign in the following cases. · Immediately before an open parenthesis: 2 × (5 + 4) · Immediately before a scientific function with parentheses: 2 × sin(30), 2 × '(3) · Before a prefix symbol (excluding the minus sign): 2 × h123 · Before a variable name, constant, or random number: 20 × A, 2 × , 2 × i A Final Closed Parenthesis You can omit one or more closed parentheses that come at the end of a calculation, immediately before the w key is pressed. Example: (2 + 3) (4 - 1) = 15 b (2+3) (4-1E A Calculation Expression Wrapping (Linear Display) When using linear display, calculation expressions that are longer than 16 characters (numbers, letters, and operators) are wrapped automatically to the next line. Example: 123456789 + 123456789 = 246913578 b 123456789+ 123456789E E-15 A Number of Input Characters (Bytes) As you input a mathematical expression, it is stored in memory called an "input area," which has a capacity of 127 bytes. This means you can input up to 127 bytes for a single mathematical expression. When linear display is selected as the display format, each function normally uses one or two bytes of memory. With the natural display format, each function use four or more bytes of memory. For more information, see "Inputting Calculation Expressions Using Natural Display" on page 17. Normally, the cursor that indicates the current input location on the display is either a flashing vertical bar (|) or horizontal bar ( ). When the remaining capacity of the input area is 10 bytes or less, the cursor changes to a flashing box (k).

*If this happens, stop input of the current expression at some suitable location and calculate its result. k Using Natural Display While natural display is selected as the display format (page 11), you can input fractions and some scientific functions just as they are written. A Natural Display Basics The table below lists the types of scientific functions that you can input using natural display format. · The *1 column shows the number of bytes of memory used up by each scientific function. See "Number of Input Characters (Bytes)" (page 16) for more information. · For information about the *2 column, see "Using Values and Expressions as Arguments" (page 18). Scientific Functions that Support Natural Display Function Improper Fraction Mixed Fraction log(a,b) 10^x ' 1'(() z {MATH}c7(logab) 1l($) 1i(%) ! 1((#) x 1)(x) 6 16(") z {MATH}c1(Abs) z {MATH}1(dX) 1 3 Key Operation *1 9 14 7 4 4 4 9 4 5 4 9 4 8 *2 Yes No Yes Yes Yes Yes Yes No No Yes Yes Yes Yes e^x Square Root (') Cube Root (') Square Reciprocal Power Power Root Absolute Value (Abs) Integral E-16 Function Derivative Second Derivative Key Operation z {MATH}2(d/dX) z {MATH}3(d /dX) z {MATH}4(() 2 2 *1 7 7 11 *2 Yes Yes Yes Calculation Note If you include values or expressions in parentheses ((and)) while using natural display, the height of the parentheses will adjust automatically depending on whether they enclose one line or two lines.*

Regardless of their height, opening and closing parentheses take up one byte of memory each. Inputting Calculation Expressions Using Natural Display 1. To input a specific function, perform the operation in the "Key Operation" column of the "Scientific Functions that Support Natural Display" table.
*2. At the input fields indicated by , input the required values and expressions. · Use the cursor keys to move between the input fields of the expression. 1+2 Example: To input 2×3 B Specify fraction input: ' Input the numerator: 1+2 Move the cursor to the denominator: c Input the denominator: 2*3 Execute the calculation: E Important! · Certain types of expressions can cause the height of a calculation formula to be greater than one display line. The maximum allowable height of a calculation formula is two display screens (31 dots × 2).*
Further input will become impossible if the height of the calculation you are inputting exceeds the allowable limit. · Nesting of functions and parentheses is allowed. Further input will become impossible if you nest too many functions and/or parentheses. If this happens, divide the calculation into multiple parts and calculate each part separately. E-17 A Scrolling the Screen Left and Right The screen will show up to 14 characters when inputting with natural display. When you input more than 14 characters, the screen will scroll automatically. If this happens, the] symbol will turn on to let you know that the expression runs off the left side of the display. B Input expression Displayed expression 1111 + 2222 + 3333 + 444 Cursor · While the] symbol is turned on, you can use the d key to move the cursor to the left and scroll the screen. · Scrolling to the left causes part of the expression to run off the right side of the display, which is indicated by the ' symbol on the right. While the ' symbol is on the screen, you can use the e key to move the cursor to the right and scroll the screen. A Using Values and Expressions as Arguments When inputting with natural display, in certain cases you can use a value or an expression that is enclosed in parentheses that you have already input as the argument of a scientific function (such as '), the numerator of a fraction, etc. For the sake of explanation here, a natural display function that supports the use of previously input values or parenthetical expressions is called an "insertable natural display function". Example: To insert the natural display function ' into the parenthetical expression in the following calculation: 1 + (2 + 3) + 4 B (Move the cursor immediately to the left of the parenthetical expression.) 1Y(INS) ! Note · Not all natural display functions are insertable. Only the scientific functions for which "Yes" appears in the column of the table under "Scientific Functions that Support Natural Display" (page 16) are insertable.

· The cursor can be immediately to the left of a parenthetical expression, a numeric value, or a fraction. Inserting an insertable function will make the parenthetical expression, value, or fraction the argument of the inserted function. · If the cursor is located immediately to the left of a scientific function, the entire function becomes the argument of the inserted function. E-18 k Editing a Calculation A Insert Mode and Overwrite Mode The calculator has two input modes. The insert mode inserts your input at the cursor location, shifting anything to the right of the cursor to make room. The overwrite mode replaces the key operation at the cursor location with your input. Only the insert mode is available when natural display is selected as the display format. You cannot change to the overwrite mode. When linear display is selected as the display format, you can choose either the insert mode or overwrite mode for input. Original Expression Insert Mode Overwrite Mode Cursor Pressing + Cursor A vertical cursor (|) indicates the insert mode, while a horizontal cursor ( ) indicates the overwrite mode.
*Selecting an Input Mode The initial default input mode setting is insert mode. If you have linear display selected as the display format and want to change to the overwrite mode, press: 1Y(INS). A Editing a Key Operation You Just Input When the cursor is located at the end of the input, press Y to delete the last key operation you performed. Example: To correct 369 × 13 so it becomes 369 × 12 Bb 369*13 Y 2 A Deleting a Key Operation With the insert mode, use d and e to move the cursor to the right of the key operation you want to delete and then press Y. With the overwrite mode, move the cursor to the key operation you want to delete and then press Y.*
*Each press of Y deletes one key operation. Example: To correct 369 × × 12 so it becomes 369 × 12 Insert Mode Bb 369**12 E-19 dd Y Overwrite Mode b 369**12 ddd Y A Editing a Key Operation within an Expression With the insert mode, use d and e to move the cursor to the right of the key operation you want to edit, press Y to delete it, and then perform the correct key operation. With the overwrite mode, move the cursor to the key operation you want to correct and then perform the correct key operation. Example: To correct cos(60) so it becomes sin(60) Insert Mode Bb c60) dddY s Overwrite Mode b c60) dddd s A Inserting Key Operations into an Expression Be sure to select the insert mode whenever you want to insert key operations into an expression. Use d and e to move the cursor to the location where you want to insert the key operations and then perform them.*
*E-20 k Finding the Location of an Error If your calculation expression is incorrect, an error message will appear on the display when you press E to execute it. Pressing the J, d, or e key after an error message appears will cause the cursor to jump to the location in your calculation that caused the error so you can correct it. Example: When you input 14 ÷ 0 × 2 = instead of 14 ÷ 5 × 2 = (The following examples use the insert mode.) b 14/0*2E J (or e, d) Location of Error D5 E · Instead of pressing J, e or d while an error message is displayed to find the location of the error, you could also press o to clear the calculation. Displaying Decimal Results while Natural Display is Selected as the Display Format Pressing E to execute a calculation while natural display is selected will display the result in natural format. Pressing 1E will execute the calculation and display the result in decimal format. To display the result in this format: Natural Format Decimal Format Perform this key operation: E 1E Note When linear display is selected as the display format, execution of a calculation is always displayed in linear (decimal) format, regardless of whether you press E or 1E.*

E-21 k Example Calculations Example: '+'= 3' 2 8 2 B !2e+!8E Produce the result in decimal format: !2e+!81E Using the f Key (S-D Transformation) You can use the f key to transform a value between its decimal (D) form and its standard (S) form (fraction, ',). Important! · Depending on the type of calculation result that is on the display when you press the f key, the conversion process may take some time to perform. · With certain calculation results, pressing the f key will not convert the displayed value.

k Examples of S-D Transformation Example 1: While linear display is selected as the display format, to perform the calculation 111 ÷ 33, and then convert the result to fraction format b 111/33E f f E-22 Note · Each press of the f key toggles the displayed result between the two forms. · The format of the fraction depends on which fraction display format (improper or mixed) is currently selected (page 12). Example 2: While natural display is selected as the display format, to perform the calculation 111 ÷ 33, and then convert the result to decimal format B 111/33E f f Example 3: While natural display is selected as the display format, to perform the calculation shown below, and then convert the result to decimal format B 15()'2c5E f Basic Calculations Unless otherwise noted, the calculations in this section can be performed in any of the calculator's calculation mode, except for the BASE-N Mode. k Arithmetic Calculations Arithmetic calculations can be used to perform addition (+), subtraction (-), multiplication (*), and division (/). E-23 Example 1: 2.5 + 1 - 2 = 1.5 b 2.5+1-2E Example 2: 7 × 8 - 4 × 5 = 36 b 7*8-4*5E · The calculator determines the proper priority sequence for addition, subtraction, multiplication, and division automatically. See "Calculation Priority Sequence" on page 128 for more information. k Fractions Keep in mind when inputting fractions on your calculator that the input procedure you need to use depends on whether natural display or linear display is selected as the display format (page 11), as shown below. Natural Display: Key Operation Improper Fraction Mixed Fraction '7c3 1'(() 2e1c3 2 Display 7 3 1 3 Linear Display: Key Operation Improper Fraction 7'3 Display 7{3 Numerator Denominator Mixed Fraction 2'1'3 2{1{3 Integer Numerator Denominator As you can see above, natural display lets you input fractions as they appear in your textbook, while linear display requires input of a special symbol ({). Note · Under initial default settings, fractions are displayed as improper fractions. · Fraction calculation results are always reduced automatically before being displayed. Executing 2 { 4 =, for example, will display the result 1 { 2. E-24 A Fraction Calculation Examples Example 1: B 2 1 7 + = 3 2 6 '2c3 e+ '1c2 E b 2'3+1'2 E 1 2 11 +1 =4 (Fraction Display Format: ab/c) 4 3 12 3'1'4+ 1'2'3E Example 2: 3 b B 1'(()3e1c4e+ 1'(()1e2c3E E-25 Note · If the total number of elements (integer digits + numerator digits + denominator digits + separator symbols) that make up a mixed fraction expression is greater than 10, the calculation result will be displayed in decimal form.*

· If an input calculation includes a mixture of fraction and decimal values, the result will be displayed in decimal format. · You can input integers only for the elements of a fraction. A Switching between Improper Fraction and Mixed Fraction Format To convert an improper fraction to a mixed fraction (or a mixed fraction to an improper b d fraction), press 1f(a -- --). c c A Switching between Fraction and Decimal Format Use the procedure below to toggle a displayed calculation result between fraction and decimal format. 33 Example: 1.

*5 = , = 1.5 22 b 1.5E f The current fraction display format setting determines if an improper or mixed fraction is displayed. f Note The calculator cannot switch from decimal to fraction format if the total number of elements (integer digits + numerator digits + denominator digits + separator symbols) that make up a mixed fraction is greater than 10. k Percent Calculations Inputting a value and with a percent (%) sign makes the value a percent. The percent (%) sign uses the value immediately before it as the argument, which is simply divided by 100 to get the percentage value. A Percent Calculation Examples All of the following examples are performed using linear display (b). E-26 Example 1: 2% = 0.02 (2) 100 21,(%)E 20) 100 Example 2: 150 × 20% = 30 (150 × 150*201,(%)E Example 3: What percent of 880 is 660? 660/880 1,(%)E Example 4: Increase 2500 by 15%. 2500+2500* 151,(%)E Example 5: Reduce 3500 by 25%.*

3500-3500 251,(%)E k Degree, Minute, Second (Sexagesimal) Calculations You can perform calculations using sexagesimal values, and you can convert between sexagesimal and decimal. A Inputting Sexagesimal Values The following is basic syntax for inputting a sexagesimal value. {Degrees}${Minutes}${Seconds}$ Example: To input 2°30´30 b 2e30e30eE · Note that you must always input something for the degrees and minutes, even if they are zero. Example: To input 0°00´30, press 0$0$30$. E-27 A Sexagesimal Calculation Examples · The following types of sexagesimal calculations will produce sexagesimal results. - Addition or subtraction of two sexagesimal values - Multiplication or division of a sexagesimal value and a decimal value Example 1: 2°20´30 + 39´30 = 3°00´00 b 2e20e30e+ 0e39e30eE Example 2: 2°20´00 × 3.5 = 8°10´00 b 2e20e* 3.5E A Performing a Decimal Calculation to Obtain a Sexagesimal Result You can use the "'DMS" command to execute a decimal calculation and obtain a sexagesimal result. The "'DMS" command can be used in the COMP Mode only. Example: Perform the calculation 100 ÷ 3 so it produces a sexagesimal result b 100/3E z {ANGLE}4('DMS)E A Converting between Sexagesimal and Decimal Pressing $ while a calculation result is displayed will toggle the value between sexagesimal and decimal. Example: To convert 2.255 to sexagesimal b 2.255E e Calculation History and Replay You can use calculation history in the COMP and BASE-N Modes. E-28 k Accessing Calculation History The `symbol in the upper right corner of the display indicates that there is data stored in calculation history. To view the data in calculation history, press f.*

Each press of f will scroll upwards (back) one calculation, displaying both the calculation expression and its result.

Example: B 1+1E2+2E 3+3E f f While scrolling through calculation history records, the $ symbol will appear on the display, which indicates that there are records below (newer than) the current one. When this symbol is turned on, press c to scroll downwards (forward) through calculation history records. Important! · Calculation history records are all cleared when you change to a different calculation mode, or when you change the display format. · Calculation history capacity is limited.

*Whenever you perform a new calculation while calculation history is full, the oldest record in calculation history is deleted automatically to make room for the new one. Note A calculation that contains any of the following functions is not stored in calculation history when it is executed. CALC, SOLVE, Built-in Formulas, User Formulas k Using Replay While a calculation history record is on the display, press d or e to display the cursor and enter the editing mode. Pressing e displays the cursor at the beginning of the calculation expression, while d displays it at the end. After you make the changes you want, press E to execute the calculation. Example: 4 × 3 + 2.5 = 14.5 4 × 3 7.1 = 4.9 b 4*3+2.*

5E E-29 d YYYY -7.1E Using Multi-statements in Calculations A multi-statement is a statement that is made up of multiple calculation expressions separated by special separator codes (: and ^). The following examples show how the two separator codes differ from each other. {expression 1} : {expression 2} : .... : {expression n} Pressing E executes each expression in sequence, starting with {expression 1} and ending with the final expression in the series. After that, the result of the final expression appears on the display. Example: To perform the calculation 123 + 456, and then subtract its result from 1000 b 123+4561!(:) 1000-1-(Ans) E {expression 1} ^ {expression 2} ^ .

... ^ {expression n} In this case, pressing E starts execution starting with {expression 1}. When execution reaches a ^ separator, execution pauses and the calculation result up to that point appears on the display.

Pressing E again will resume execution from the expression below the ^ separator. Example: To display the result of the calculation 123 + 456, and then subtract it from 1000 b 123+4561x(^) 1000-1-(Ans) E-30 E E Note · The Q symbol turns on in the upper right corner of the display when execution of a multi-statement calculation has been paused by a ^ separator. · When performing a multi-statement calculation, Ans (Answer Memory) (page 32) is updated each time any of the statements that makes up a multi-statement produces a result. · You can mix "^" and ":" separators within the same calculation. Calculator Memory Operations Your calculator includes the types of memory described below, which you can use for storage and recall of values.

Memory Name Answer Memory Independent Memory Description Answer Memory contains the result of the last calculation you performed. Independent memory comes in handy when adding or subtracting multiple calculation results. The letters A through Z can be assigned different values individually and used in calculations. Note that variable M is also used for storing independent memory values. You can create extra variables when you need storage for more values than provided by the 26 letters from A through Z. You can reserve up to 2372 extra variables, which are named Z[1], Z[2], etc. The following literal variables are used by the calculator's built-in formulas or user formulas. · Lower-cast alphabetic characters: a through z · Greek characters: through , through · Subscripted alphabetic and Greek characters: A1, a0, t, x, etc. For details about built-in formulas and formula variables, see "Built-in Formulas" (page 97). Variables Extra Variables Formula Variables The types of memory described above are not cleared when you press the o key, change to another mode, or turn off the calculator.

*E-31 k Using Answer Memory (Ans) The result of any new calculation you perform on the calculator is stored automatically in Answer Memory (Ans). A Automatic Insertion of Ans in Consecutive Calculations If you start a new calculation while the result of a previous calculation is still on the display, the calculator will insert Ans into the applicable location of the new calculation automatically. Example 1: To divide the result of 3 × 4 by 30 b 3*4E (Next) /30E Pressing / inputs Ans automatically. Example 2: To determine the square root of the result of 3 + 4 2 2 b 3x+4xE !E Note · As in the above examples, the calculator automatically inserts Ans as the argument of any calculation operator or scientific function you input while a calculation result is on the display. · In the case of a function with a parenthetical argument (page 15), Ans automatically becomes the argument only in the case that you input the function alone and then press E. Note, however, that with natural display Ans may not become the argument automatically when using a function with a parenthetical argument. · Basically, Ans is inserted automatically only when the result of the previous calculation is still on the display, immediately after you executed the calculation that produced it. If you want to insert Ans after clearing the display by pressing o, press 1-(Ans). E-32 A Inserting Ans into a Calculation Manually You can insert Ans into a calculation at the current cursor location by pressing 1-(Ans). Example 1: To use the result of 123 + 456 in another calculation as shown below 123 + 456 = 579 789 579 = 210 b 123+456E 789-1-(Ans)E Example 2: To determine the square root of 3 + 4 and then add 5 to the result 2 2 b 3x+4xE !1-(Ans))+5E k Using Independent Memory Independent memory (M) is used mainly for calculating cumulative totals.*

*A Adding to Independent Memory While a value you input or the result of a calculation is on the display, press l to add it to independent memory (M). Example: To add the result of 105 ÷ 3 to independent memory (M) b 105/3l A Subtracting from Independent Memory While a value you input or the result of a calculation is on the display, press 1l(M) to subtract it from independent memory (M). E-33 Example: To subtract the result of 3 × 2 from independent memory (M) b 3*21l(M) Note Pressing l or 1l(M) while a calculation result is on the display will add it to or subtract it from independent memory. Important! The value that appears on the display when you press l or 1l(M) at the end of a calculation in place of E is the result of the calculation (which is added to or subtracted from independent memory). It is not the current contents of independent memory.*

A Viewing Independent Memory Contents Press ~9(M).

*A Clearing Independent Memory Contents (to 0) 01~(STO)9(M) A Calculation Example Using Independent Memory Press 01~(STO)9(M) to clear independent memory contents before performing the following operation. Example: -) 23 + 9 = 32 53 6 = 47 45 × 2 = 90 99 ÷ 3 = 33 (Total) 22 23+9m 53-6m 45*21m(M) 99/3m t9(M) (Recalls value of M.) k Using Variables Your calculator supports the use of 26 variables, named A through Z. A Assigning a Value or Calculation Result to a Variable Use the procedure shown below to assign a value or a calculation expression to a variable. Example: To assign 3 + 5 to variable A 3+51~(STO)0(A) A Viewing the Value Assigned to a Variable To view the value assigned to a variable, press ~ and then specify the variable name. You could also press S, specify the variable name, and then press E. Example: To view the value assigned to variable A ~0(A) or S0(A)E E-34 A Using a Variable in a Calculation You can use variables in calculations the same way you use values. Example: To calculate 5 + A 5+S0(A)E A Clearing the Value Assigned to a Variable (to 0) Example: To clear variable A 01~(STO)0(A) A Clearing All Variables (to 0) Use the MEMORY Mode screen to clear the contents of all the variables. See "Memory Manager (MEMORY)" on page 126 for more information. k Clearing All Memory Contents Perform the operation below when you want to clear all variables (including variable M) and Answer Memory (Ans) to zero. z {CLR} {Memory}E Reserving Variable Memory If you find that the calculator's default variables (A through Z) are not enough for your purposes, you can reserve variable memory and create "extra variables" for storage of value. Extra variables work like array variables of an array named "Z" when assigning or recalling their values. An extra variable name consists of the letter "Z" followed by a value in brackets, like Z[5]. k User Memory Area Your calculator has a 28500-byte user memory area that you can use to reserve variable memory and add extra variables.*

Important! · You can perform the procedure to reserve variable memory in the COMP Mode or in a COMP Mode program. All of the sample operations in this section are performed in the COMP Mode (N1). · The 28500-byte user memory is used for storage of extra variables and programs. This means that increasing the number of extra variables reduces the amount of memory available for storing programs. So also, storing programs in memory reduces the amount of memory available for storing extra variables. E-35 A Adding Extra Variables Example: To increase the number of variables by 10 b 10z {PROG} {/}1.(Dim Z)E · When "Done" appears on the display, it means that the number of extra variables you specified has been added. At this point, zero is assigned to all of the extra variables. (To check the value of Z[10]) oS5(Z) Si(])10S6(])E Note Reserving variable memory uses up a basic 26 bytes, plus 12 bytes for each of the extra variables that you add. Note that storing a complex number of an extra variable uses up 22 bytes.
Adding 10 extra variables as shown above, for example, uses up 26 + (12 × 10) = 146 bytes of the user memory area. Since user memory has a total capacity of 28500 bytes, the limit on the number of extra variables you can add is 2372 (assuming you do not have any complex numbers assigned to the extra variables). k Using Extra Variables After creating extra variables, you can assign values to them and insert them into calculations just as you do with the default valuables (from A through Z). Just remember that extra variable names consist of the letter "Z" followed by a value in brackets, like Z[5]. Note · The closing bracket ( ]) of the extra variable name can be omitted.
· In place of a value inside the brackets of an extra variable name, you can use a calculation expression or a default array name (A to Z). · Note that the value in the brackets of an extra variable name must be in the range of 1 and the number of extra variables that have been added. Trying to use a value that exceeds the number of extra variables will cause an error. A Assigning a Value or Calculation Result to an Extra Variable You can assign a value to an extra variable using the following command syntax: {value or expression} / Z[{extra variable value}] E. Example: To assign 3 + 5 to variable Z[5] b 3+5z {PROG} {/} S5(Z)Si(])5S6(])E E-36 Important! You can write data to extra variables in the COMP Mode or in a COMP Mode program.
A Recalling the Contents of an Extra Variable Input the name (Z[n]) of the extra variable whose contents you want to recall, and then press E. Example: To recall the contents of extra variable Z[5] b S5(Z)Si(])5a6(])E A Using an Extra Variable in a Calculation You can use extra variables in calculations the same way you use values. Example: To calculate 5 + Z[5] b 5+S5(Z)Si(])5S6(])E A Clearing Extra Variable Contents (to 0) Example: To clear extra variable Z[5] 0z {PROG} {/}S5(Z)ai(])5S6(])E A Clearing All Extra Variables Perform the operation below when you want delete all extra variables that are currently in calculator memory. 0z {PROG} {/}1.(Dim Z)E Note You can also use the MEMORY Mode screen to delete all the extra variables. See "Memory Manager (MEMORY)" on page 126 for more information. Using and Scientific Constants k Pi () Your calculator supports input of pi () into calculations. Pi () is supported in all modes, except for the BASE-N Mode. The following is the value that the calculator uses for . = 3.

14159265358980 (1Z()) E-37 k Scientific Constants Your calculator has 40 often-used scientific constants built in. Like , each scientific constant has a unique display symbol. Scientific constants are supported in all modes, except for the BASE-N Mode. A Inputting a Scientific Constant 1. Press z to display the function menu. 2. On the menu, select "CONST". · This displays page 1 of the scientific constant menu. · There are five scientific command menu screens, and you can use c and f to navigate between them. For more information about scientific constants, see "List of Scientific Constants" on page 39.
3. Use c and f to scroll through the pages and display the one that contains the scientific constant you want. 4. Press the number key (from 1 to 8) that corresponds to the scientific constant you want to select. · This will input the scientific constant symbol that corresponds to the number key you press. 1 · Pressing E here will display the value of the scientific constant whose symbol is currently on the screen. A Example Calculations Using Scientific Constants Example: To calculate the constant for the speed of light in a vacuum (c0 = 1/ 0μ 0) b 1/! z {CONST}ccc8(0) E-38 z {CONST}cccc1(0)) E A List of Scientific Constants The numbers in the "No.

" column show the scientific constant menu page number on the left and the number key you need to press to select the constant when the proper menu page is displayed. No. 1-1 1-2 1-3 1-4 1-5 1-6 1-7 1-8 2-1 2-2 2-3 2-4 2-5 2-6 2-7 2-8 3-1 3-2 3-3 3-4 Scientific Constant Proton mass Neutron mass Electron mass Muon mass Bohr radius Planck constant Nuclear magneton Bohr magneton Planck constant, rationalized Fine-structure constant Classical electron radius Compton wavelength Proton gyromagnetic ratio Proton Compton wavelength Neutron Compton wavelength Rydberg constant Atomic mass constant Proton magnetic moment Electron magnetic moment Neutron magnetic moment No.

3-5 3-6 3-7 3-8 4-1 4-2 4-3 4-4 4-5 4-6 4-7 4-8 5-1 5-2 5-3 5-4 5-5 5-6 5-7 5-8 Scientific Constant Muon magnetic moment Faraday constant Elementary charge Avogadro constant Boltzmann constant Molar volume of ideal gas Molar gas constant Speed of light in vacuum First radiation constant Second radiation constant Stefan-Boltzmann constant Electric constant Magnetic constant Magnetic flux quantum Standard acceleration of gravity Conductance quantum Characteristic impedance of vacuum Celsius temperature Newtonian constant of gravitation Standard atmosphere · The values are based on CODATA Recommended Values (2000). For details, see <#01> in the separate Supplement. E-39 Scientific Function Calculations Unless otherwise noted, the functions in this section can be used in any of the calculator's calculation modes, except for the BASE-N Mode. Scientific Function Calculation Precautions · When performing a calculation that includes a built-in scientific function, it may take some time before the calculation result appears. Do not perform any key operation on the calculator until the calculation result appears. · To interrupt an on-going calculation operation, press @. Interpreting Scientific Function Syntax · Text that represents a function's argument is enclosed in braces ({ }). Arguments are normally {value} or {expression}. · When braces ({ }) are enclosed within parentheses, it means that input of everything inside the parentheses is mandatory. k Trigonometric and Inverse Trigonometric Functions sin(, cos(, tan(, sin (, cos (, tan (1 1 1 A Syntax and Input sin({n}) (Other functions may be used in argument.

) Example: sin 30 = 0.5, sin 0.5 = 30 1 bv s30)E 1s(sin)0.5)E 1 A Remarks The angle unit you need to use in a calculation is the one that is currently selected as the default angle unit. E-40 k Angle Unit Conversion You can convert a value that was input using one angle unit to another angle unit. After you input a value, select z {ANGLE} to display the menu screen shown below. 1(°): Degrees 2(r): Radians 3(g): Grads Example: To convert bv radians to degrees 2 (15()/2) z {ANGLE}2(r)E k Hyperbolic and Inverse Hyperbolic Functions sinh(, cosh(, tanh(, sinh (, cosh (, tanh (1 1 1 A Syntax and Input sinh({n}) (Other functions may be used in argument.) Example: sinh 1 = 1.175201194 b z {MATH}cc1(sinh)1) A Remarks To input a hyperbolic or inverse hyperbolic function, perform the following operation to display a menu of functions: z {MATH}cc. k Exponential and Logarithmic Functions 10^(, e^(, log(, ln(A Syntax and Input 10^({n}) .

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..... 10 log({n}) .....
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.. log10{n} log({m},{n}) .....
.....
.....
... log{m}{n} ln({n}) .....

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.....
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.. loge{n} {n} (Same as e^() (Common Logarithm) (Base {m} Logarithm) (Natural Logarithm) E-41 Example 1: log216 = 4, log16 = 1.204119983 b l2,16)E l16)E Base 10 (common logarithm) is assumed when no base is specified. B z {MATH}c7(logab) 2e16E Example 2: ln 90 (= loge 90) = 4.49980967 b i90)E k Power Functions and Power Root Functions x2, x1, ^(, '(, 3'(, x'(A Syntax and Input {n} x .....

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.....
.....
..... {n} 1 1 {n} x ....

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.....
.....
..... {n} {n} {(m)}^({n}) .....

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.....
... {m} '({n}) ..
.....

.....
.... {n} 3 3 '({n}) .
.....
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..... {n} {m} {n} ({m})x'({n}) .
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..... 2 2 (Square) (Reciprocal) (Power) (Square Root) (Cube Root) (Power Root) 2+2 Example 1: (' + 1) (' 1) = 1, (1 + 1) 2 2 = 16 b (!2)+1) (!2)-1)E E-42 (1+1)62+2)E B (!2e+1) (!2e-1)E (1+1)62+2E 2 Example 2: (2) 3 = 1.587401052 b (-2)6(2'3)E k Integration Calculation Your calculator performs integration using Gauss-Kronrod integration for approximation. The calculator uses the following function for integration.

(A Syntax and Input (f(x), a, b, tol) f(x): Function of x (Input the function used by variable X.) · All variables other than X are viewed as constants. a: Lower limit of region of integration b: Upper limit of region of integration tol: Error tolerance range (Can be input only when linear display is being used.) 5 · This parameter can be omitted. In that case, a tolerance of 1 × 10 is used. Example: (ln(x), 1, e) = 1 (tol value not input) B z {MATH}1(dX) iS0(X))c1f1i(%)1E E-43 b z {MATH}1(dX) iS0(X)),1,1i(%)1))E A Remarks · Use of (is supported in the COMP, SD, REG, and EQN Modes only. · The following functions cannot be input for the f(x), a, b, and tol parameters: (, d/dx(, d2/dx2(, (. In addition, the Pol(and Rec(functions, and the random number functions cannot be input for the f(x) parameter. · The integration result will be negative when the limit of region of integration parameters are within the range a < x < b and f(x) < 0. 2 Example: (0.

5X 2, 2, 2) = 5.333333333 · In the case of integration of a trigonometric function, select Rad for the angle unit. · Integration calculations can take a long time to complete. · Specifying a smaller value for the tol parameter tends to improve precision, but it also 14 causes the calculation to take more time. Specify a tol value greater than 1 × 10 .

· You will not be able to input a tol value while using natural display. · The type of function being integrated, positive and negative values within the region of integration, and the region of integration being used can cause large error in integration values and errors. · You can interrupt an ongoing integration calculation operation by pressing o. · For periodic functions, and for positive and negative f(x) values due to the region of integration being used / Divide the integration into parts for each period, or between positive and negative parts, obtain integration values for each, and then add the values. A Tips to for Successful Integration Calculations S Positive S Negative b a f(x)dx = c a f(x)dx + (b c f(x)dx) Positive Part (S Positive) Negative Part (S Negative) · For widely fluctuating integration values due to a minutely shifting region of integration / Divide the integration interval into multiple parts (in a way that breaks areas of wide fluctuation into small parts), perform integration on each part, and then combine the results.

E-44 k Derivative b a f(x)dx = x1 a f(x)dx + x2 x1 f(x)dx + ...+ b x4 f(x)dx Your calculator performs differential calculations by approximating the derivative based on centered difference approximation. Calculation is performed using the function shown below. d/dx(A Syntax and Input d/dx(f (x), a, tol) f(x): Function of x (Input the function used by variable X.) · All variables other than X are viewed as constants. a: Value of point (derivative point) of desired derivative coefficient tol: Error tolerance range (Can be input only when linear display is being used.

) · This parameter can be omitted. In that case, a tolerance of 1 × 10 10 is used. Example: To obtain the differential coefficient at point x = for the function y = sin(x) 2 (tol value not input) V B z {MATH}2(d/dX)sS0(X)).....1 (Continuing from 1, above) e'1Z()c2E b (Continuing from 1, above) ,1Z()'2)E A Remarks · Use of d/dx(is supported in the COMP, SD, REG, and EQN Modes only. 2 2 · The following functions cannot be input for the f(x), a, and tol parameters: (, d/dx(, d /dx (, (. In addition, the Pol(and Rec(functions, and the random number functions cannot be input for the f(x) parameter.
· In the case of differentiation of a trigonometric function, select Rad for the angle unit. · Specifying a smaller value for the tol parameter tends to improve precision, but it also 14 causes the calculation to take more time. Specify a tol value greater than 1 × 10 . · You will not be able to input a tol value while using natural display. · Non-consecutive points, abrupt fluctuation, extremely large or small points, inflection points, and the inclusion of points that cannot be differentiated, or a differential point or E-45 differential calculation result that approaches zero can cause poor precision or error.
· You can interrupt an ongoing differential calculation operation by pressing o. k Second Derivative Your calculator lets you calculate the second derivative coefficient (d /dx (f (x))|x=a) for f (x) where x = a. Your calculator uses approximation based on the second order value differential equation of the Newton interpolation polynomial. Calculation is performed using the function shown below. 2 2 d2/dx2(A Syntax and Input d 2/dx2(f (x), a, tol) f (x): Function of x (Input the function used by variable X.
) · All variables other than X are viewed as constants. Value of point (second derivative point) of desired second derivative coefficient tol: Error tolerance range (Can be input only when linear display is being used.) 10 · This parameter can be omitted. In that case, a tolerance of 1 × 10 is used. a: Example 1: To obtain the second derivative coefficient for the function y = x + 4x + x 6 when x = 3 3 2 B z {MATH}3(d /dX)S0(X)63e +4S0(X)x+S0(X)-6e3E 2 2 Example 2: To perform the same procedure as Example 1, specifying tol = 1 × 10 12 Since you want to specify a value for tol, you will need to perform this calculation using linear display. b z {MATH}3(d /dX)S0(X)63)+4 S0(X)x+S0(X)-6,3,1Z12)E 2 2 A Remarks See the remarks for derivative on page 45. k Calculation This function determines the sum of an input f (x) for a specified range. Calculation is performed using the function shown below. (E-46 The following shows the calculation formula used for calculations. (f (x), x, a, b) = f (a) + f (a+1) + .

... + f (b) A Syntax and Input (f (x), x, a, b) f (x): Function of x (parameter variable specified below) x: Parameter variable (Any letter from A through Z) · If the variable name you specify here does not match the variable name used within the function of x, the variable in the function will be treated as a constant. a: Start point of calculation range b: End point of calculation range 10 10 · a and b are integers in the range of 1 × 10 < a < b < 1 × 10 . · The step for this calculation is fixed as 1. Example: (X + 1, X, 1, 5) = 20 B z {MATH}4(()S0(X) +1ea0(X)e1e5E b z {MATH}4(()S0(X) +1,a0(X),1,5)E A Remarks · Use of (is supported in the COMP, SD, REG, and EQN Modes only. 2 2 · The following functions cannot be input for the f(x), a, and b parameters: (, d/dx(, d /dx (, (. In addition, the Pol(and Rec(functions, and the random number functions cannot be input for the f(x) parameter. · You can interrupt an ongoing calculation operation by pressing o.
k Coordinate Conversion (Rectangular Polar) Pol(, Rec(Your calculator can convert between rectangular coordinates and polar coordinates. o o Rectangular Coordinates (Rec) Polar Coordinates (Pol) E-47 A Syntax and Input Rectangular-to-Polar Coordinate Conversion (Pol) Pol(x, y) x: Rectangular coordinate x-value y: Rectangular coordinate y-value Polar-to-Rectangular Coordinate Conversion (Rec) Rec(r,) r : Polar coordinate r-value : Polar coordinate -value 2, 2 Example 1: To convert the rectangular coordinates (' ') to polar coordinates bv 1+(Pol)!2) ,!2))E Bv 1+(Pol)!2e ,!2e)E Example 2: To convert the polar coordinates (2, 30°) to rectangular coordinates bv 1-(Rec)2, 30)E A Remarks · These functions can be used in the COMP Mode. · The r-value or x-value produced by the calculation is assigned to variable I, while the -value or y-value is assigned to variable J (page 34). · The values obtained for when converting from rectangular coordinates to polar coordinates is within the range 180° < < 180°. · When executing a coordinate conversion function inside of a calculation expression, the calculation is performed using the first coordinate that the conversion produces (r-value or x-value).
2, 2 Example: Pol (' ') + 5 = 2 + 5 = 7 E-48 k Random Number Functions Your calculator comes with functions for generating ten-digit non-sequential random numbers, ten-digit sequential random numbers, or random integers within a specific range. The following are the random number generation functions. Ran#, RanInt#(A Non-sequential Random Numbers (Decimal Values) The following generates ten-digit non-sequential fractional numbers in the range of 0 to 1. Syntax: Ran# Example: To generate ten-digit non-sequential random numbers B z {MATH}6(Ran#)E E E The above values are provided for example only. The actual values produced by your calculator for this function will be different.
A Sequential Random Numbers (Decimal Values) In this case, ten-digit sequential random numbers are generated in the range of 0 to 1 in accordance with nine sequences numbered from 1 through 9. The sequence is specified by the integer argument (1 through 9) of Ran#. The random numbers generated in accordance with the argument are generated in a fixed sequence.