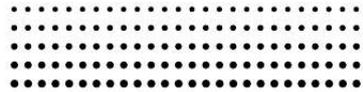




Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for CASIO FX-115MS. You'll find the answers to all your questions on the CASIO FX-115MS in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

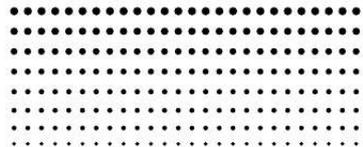
User manual CASIO FX-115MS
User guide CASIO FX-115MS
Operating instructions CASIO FX-115MS
Instructions for use CASIO FX-115MS
Instruction manual CASIO FX-115MS



fx-95MS
fx-100MS
fx-115MS (*fx-912MS*)
fx-570MS
fx-991MS
User's Guide

■ **fx-912MS owners**

Please be sure to read the important notice of this manual.



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Manual abstract:

.....1

2 1 Safety Precautions Be sure to read the following safety precautions before using this calculator. Keep this manual handy for later reference. Caution This symbol is used to indicate information that can result in personal injury or material damage if ignored. Batteries · 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 batteries, try to take batteries apart, or allow batteries to become shorted. Never expose batteries to direct heat or dispose of them by incineration. · Misuse of batteries can cause them 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 (fx-95MS/100MS/570MS). · 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. · 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. · The contents of this manual are subject to change without notice. · In no event shall CASIO Computer Co., Ltd. be liable to anyone for special, collateral, incidental, or consequential damages in connection with or arising out of the purchase or use of these materials. Moreover, CASIO Computer Co.

, Ltd. shall not be liable for any claim of any kind whatsoever against the use of these materials by any other party. Handling Precautions · Be sure to press the 5 key before using the calculator for the first time. · Even if the calculator is operating normally, replace the battery at least once every three years for the fx-115MS/fx-570MS/fx-991MS, or at least once every two years for the fx-95MS/fx-100MS. 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. · 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 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. 3 · Avoid use and storage 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 moisture 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. 4 Contents Removing and Replacing the Calculator's Cover ...

.....
.....
.....
.....

.. 1 Safety Precautions

.....
.....
.....

..... 2 Handling Precautions

.....
.....
.....

..... 3 Two-line Display

.....
.....
.....

... 7 Before getting started..

.....
.....
.....

.. 7 kModes ...

.....
.....
.....

.....
.....
.....

7 kInput Capacity

.....
.....
.....
.....

. 8 kMaking Corrections During Input

.....
.....

... 9 kReplay Function ..

.....
.....

..... 9 kError Locator

.....
.....
.....

.... 9 kMulti-statements

.....
.....
.....

.... 10 kExponential Display Formats

.....
.....
.....

..... 10 kDecimal Point and Separator Symbols

. 11 k Initializing the Calculator

.....
.....

.... 11 Basic Calculations .

.....
.....
.....
.....

. 11 k Arithmetic Calculations

.....
.....
.....
.....

. kFraction Operations

.....
.....
.....

. kPercentage Calculations

.....
.....
.....

.... kDegrees, Minutes, Seconds Calculations

..... kFIX, SCI, RND

.....
.....
.....

..... kAnswer Memory .

.....
.....
.....
.....

kConsecutive Calculations

.....
.....
.....

..... kIndependent Memory

.....
.....
.....
.....

..... k Variables .

.....
.....
.....

. 11 12 14 15 15 16 17 17 17 Memory Calculations

.....
.....

..... 16 Scientific Function Calculations .

.....

.... 18 kTrigonometric/Inverse Trigonometric Functions .

.. 18 kHyperbolic/Inverse Hyperbolic Functions

.... 19 5 kCommon and Natural Logarithms/ Antilogarithms

.....

.....

.....

.....

.....

.....

..... 19 kSquare Roots, Cube Roots, Roots, Squares, Cubes, Reciprocals, Factorials, Random Numbers, , and Permutation/Combination ..

.....

.....

.....

.....

.... 20 kAngle Unit Conversion

.....

.....

.....

.....

.....

21 kCoordinate Conversion (Pol (x, y), Rec (r,))

21 kEngineering Notation Calculations

.....

.. 22 Equation Calculations ...

.....

.....

..... 22 kQuadratic and Cubic Equations ..

.....

.....

.....

.... 22 kSimultaneous Equations

.....

.....

.....

... 24 Statistical Calculations ..

.....

.....

..... 26 Standard Deviation ..

.....

.....

.....

.....

.....

.....

..... 26 Regression Calculations ..

.....

.....

.....

.....

.....

28 Technical Information

Example: Equation Calculations EQN Note! · To return the calculation mode and setup to the initial defaults shown below, press A B 2(Mode) =.
Calculation Mode: Angle Unit: Exponential Display Format: Fraction Display Format: Decimal Point Character: COMP Deg Norm 1 a/b/c Dot · Mode indicators appear in the upper part of the display. · Be sure to check the current calculation mode (SD, REG, COMP) and angle unit setting (Deg, Rad, Gra) before beginning a calculation. k Input Capacity · The memory area used for calculation input can hold 79 "steps." One step is taken up each time you press a number key or arithmetic operator key (+, -, ×, ÷, \).

A A or p key operation does not take up a step, so inputting A D, for example, takes up only one step. · You can input up to 79 steps for a single calculation. Whenever you input the 73rd step of any calculation, the cursor changes from " _ " to "k" to let you know memory is running low. If you need to input more than 79 steps, you should divide your calculation into two or more parts. · Pressing the g key recalls the last result obtained, which you can use in a subsequent calculation. See "Answer Memory" for more information about using the g key. 8 k Making Corrections During Input · Use e and r to move the cursor to the location you want. · Press [to delete the number or function at the current cursor position. · Press A K to change to an insert cursor t. Inputting something while the insert cursor is on the display inserts the input at the insert cursor position.

· Pressing A K, or = returns to the normal cursor from the insert cursor. k Replay Function · Every time you perform a calculation, the replay function stores the calculation formula and its result in replay memory. Pressing the [key displays the formula and result of the calculation you last performed. Pressing [again back steps sequentially (new-to-old) through past calculations. · Pressing the e or r key while a replay memory calculation is on the display changes to the editing screen. · Pressing the e or r key immediately after you finish a calculation displays the editing screen for that calculation. · Pressing t does not clear replay memory, so you can recall the last calculation even after you press t. · Replay memory capacity is 128 bytes for storage of both expressions and results. · Replay memory is cleared by any of the following actions. When you press the 5 key When you initialize modes and settings by pressing A B 2 (or 3) =.

When you change from one calculation mode to another When you turn off the calculator. k Error Locator · Pressing r or e after an error occurs displays the calculation with the cursor positioned at the location where the error occurred. 9 k Multi-statements A multi-statement is an expression that is made up of two or more smaller expressions, which are joined using a colon (:). · Example: To add 2 + 3 and then multiply the result by 4 $2+3p\ g-4= 2+3\ 5. Disp = Ans\times 4$ 20.

k Exponential Display Formats This calculator can display up to 10 digits. Larger values are automatically displayed using exponential notation. In the case of decimal values, you can select between two formaple 2: To calculate what percentage of 880 is 660 (75%) $660\ \ 880\ A\ v$ · Example 3 : To add 15% onto 2500 (2875) $2500 - 15\ A\ v +$ · Example 4 : To discount 3500 by 25% (2625) $3500 - 25\ A\ v ,$ · Example 5: To discount the sum of 168, 98, and 734 by 20% (800) $168 + 98 + 734 = g\ A\ j\ 1\ p\ 1 - 20\ A\ v ,$ * As shown here, if you want to use the current Answer Memory value in a mark up or discount calculation, you need to assign the Answer Memory value into a variable and then use the variable in the mark up/discount calculation. This is because the calculation performed when v is pressed stores a result to Answer Memory before the , key is pressed. · Example 6: If 300 grams are added to a test sample originally weighing 500 grams, what is the percentage increase in weight? (160%) $300 + 500\ A\ v$ · Example 7: What is the percentage change when a value is increased from 40 to 46? How about to 48? (15%, 20%) $46 , 40\ A\ v\ eeeee8= 14 * k$ Degrees, Minutes, Seconds Calculations · You can perform sexagesimal calculations using degrees (hours), minutes, and seconds, and convert between sexagesimal and decimal values.

· Example 1: To convert the decimal value 2.258 to a sexagesimal value and then back to a decimal value $2.258 = 2.258\ 2^{\circ}15'28.8$ 2.258 AO I · Example 2: To perform the following calculation: $12^{\circ}34'56" 3.45\ 12\ 1\ 34\ 1\ 56\ 1 - 3.45 = 43^{\circ}24'31.2$ k FIX, SCI, RND · To change the settings for the number of decimal places, the number of significant digits, or the exponential display format, press the F key a number of times until you reach the setup screen shown below. F i x Sc i No r m 1 2 3 · Press the number key (1, 2, or 3) that corresponds to the setup item you want to change.

1 (Fix): Number of decimal places 2 (Sci): Number of significant digits 3 (Norm): Exponential display format · Example 1: $200\ \ 7\ 14\ 200\ \ 7 - 14 =$ (Specifies three decimal places.) $400.00\ FIX\ F..... 1(Fix)\ 3\ 15\ 400.00000$ (Internal calculation continues using 12 digits.) $200\ \ 7 = 28.57100\ 400.00000 - 14 =$ The following performs the same calculation using the specified number of decimal places. $200\ \ 7 =$ (Internal rounding) $28.57100\ 399.$

$99400\ AQ - 14 =$ · Press F
3(Norm) 1 to clear the Fix specification. · Example 2: $1\ \ 3,$ displaying result with two significant digits (Sci) $F..... 2(Sci)\ 2\ 1\ \ 3 = SCI\ 3.301$ · Press F ...

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... @@@@16 · You can recall Answer Memory contents by pressing g. @@@@Independent memory is convenient for calculating cumulative totals. · Independent memory uses the same memory area as variable M. · To clear independent memory (M), input 0 A j 3 (M+). @@@@This operation deletes the data assigned to variable A. @@COMP ..

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..... @@@@Example: To convert 4.

0.8125 grams to milligrams 81.25 0.08125 = J Equation Calculations EQN The EQN Mode lets you solve equations up to three degrees and simultaneous linear equations with up to three unknowns. Use the F key to enter the EQN Mode when you want to solve an equation. EQN ..

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... F F 1 (fx-95MS) F F F 1 (Other Models) k Quadratic and Cubic Equations Quadratic Equation: $ax^2 + bx + c = 0$ Cubic Equation: $ax^3 + bx^2 + cx + d = 0$ Entering the EQN Mode and pressing \rightarrow displays the initial quadratic/cubic equation screen. Degree? 2 3 Use this screen to specify 2 (quadratic) or 3 (cubic) as the degree of the equation, and input values for each of the coefficients. Coefficient name \rightarrow indicates direction you should scroll to view other elements. a? 0. Element value 22. Any time until you input a value for the final coefficient (c for a quadratic equation, d for a cubic equation), you can use the [and] keys to move between coefficients on the screen and make changes, if you want. Note that you cannot input complex numbers for coefficients.

Calculation starts and one of the solutions appears as soon as you input a value for the final coefficient. Variable name \rightarrow indicates direction you should scroll to view other solutions. $x_1 = 0$. Solution Press the \rightarrow key to view other solutions. Use [and] to scroll between all of the solutions for the equation. Pressing the \leftarrow key at this point returns to the coefficient input screen. Certain coefficients can cause calculation to take more time. Example 1: To solve the equation $x^3 - 2x^2 + x + 2 = 0$ ($x = 2, 1, -1$) (Degree?) 3 (a?) (b?) (c?) (d?) ($x_1 = 2$) ($x_2 = 1$) ($x_3 = -1$). If a result is a complex number, the real part of the first solution appears first. This is indicated by the "RI" symbol on the display. Press A \rightarrow to toggle the display between the real part and imaginary part of a solution.

2 3 1 = D2 = D1 = 2 =]] x 1 = D RI 0.25 Ar D x 1 = RI 0.75 i Example 2: To solve the equation $8x^2 - 4x + 5 = 0$ ($x = 0.25 \pm 0.75i$) (Degree?) (a?) (b?) (c?) ($x_1 = 0$).

2 5 + 0.75i) ($x_2 = 0.25 - 0.75i$) 2 8 = D4 = 5 =] k Simultaneous Equations Simultaneous Linear Equations with Two Unknowns: $a_1x + b_1y = c_1$ $a_2x + b_2y = c_2$ Simultaneous Linear Equations with Three Unknowns: $a_1x + b_1y + c_1z = d_1$ $a_2x + b_2y + c_2z = d_2$ $a_3x + b_3y + c_3z = d_3$ Entering the EQN Mode displays the initial simultaneous equation screen. 2 Coefficient name Unk now ns? 3 Use this screen to specify 2 or 3 as the number of unknowns, and input values for each of the coefficients.

\rightarrow indicates direction you should scroll to view other elements. a1? 0. Element value 24. Any time until you input a value for the final coefficient (c2 for two unknowns, d3 for three unknowns), you can use the [and] keys to move between coefficients on the screen and make changes, if you want. Note that you cannot input complex numbers for coefficients. Calculation starts and one of the solutions appears as soon as you input a value for the final coefficient. Variable name \rightarrow indicates direction you should scroll to view other solutions. $x = 0$. Solution Press the \rightarrow key to view other solutions. Use [and] to scroll between all of the solutions for the equation. Pressing the \leftarrow key at this point returns to the coefficient input screen.

Example: To solve the following simultaneous equations $2x + 3y + z = 15$ $3x - 2y + 2z = 4$ $5x + 3y - 4z = 9$ ($x = 2, y = 5, z = 4$) (Unknowns?) (a1?) (d1?) (a2?) ...
.... (d2?) (a3?) .

.....
(d3?) ($x = 2$) ($y = 5$) ($z = 4$) 3 2 = 3 = D1 = 15 = 3 = D2 = 2 = 4 = 5 = 3 = D4 = 9 =]] 25 Statistical Calculations Standard Deviation SD REG SD Use the F key to enter the SD Mode when you want to perform statistical calculations using standard deviation. SD

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..... F 2 (fx-95MS) F F F 1 (Other Models) Always start data input with A B 1 (Scl) = to clear statistical memory. Input data using the key sequence shown below.

<x-data> S Input data is used to calculate values for n, x, x^2 , o, n and n-1, which you can recall using the key operations noted nearby. To recall this type of value: Perform this key operation: x^2 x n o n-1 AU1 AU2 AU3 AX1 AX2 AX3 Example: To calculate n, 1, n, o, n, x, and x^2 for the following data : 55, 54, 51, 55, 53, 53, 54, 52 In the SD Mode: A B 1 (Scl) = (Stat clear) 55 S n = SD 1. Each time you press S to register your input, the number of data input up to that point is indicated on the display (n value). 54 S 51 S 55 S 53 S 54 S 52 S Sample Standard Deviation (n 1) = 1.407885953 AX3 = 26 Population Standard Deviation (n) = 1.316956719 Arithmetic Mean (o) = 53.375 Number of Data (n) = 8 Sum of Values (x) = 427 Sum of Squares of Values (x^2) = 22805 AX2 = AX1 = AU3 = AU2 = AU1 = Data Input Precautions S S inputs the same data twice. You can also input multiple entries of the same data using A G. To input the data 110 ten times, for example, press 110 A G 10 S. You can perform the above key operations in any order, and not necessarily that shown above.

While inputting data or after inputting data is complete, you can use the [and] keys to scroll through data you have input. If you input multiple entries of the same data using A G to specify the data frequency (number of data items) as described above, scrolling through data shows both the data item and a separate screen for the data frequency (Freq). You can then edit the displayed data, if you want. Input the new value and then press the = key to replace the old value with the new one. This also means that if you want to perform some other operation (calculation, recall of statistical calculation results, etc.), you should always press the \leftarrow key first to exit data display. Pressing the S key instead of = after changing a value on the display registers the value you input as a new data item, and leaves the old value as it is. You can delete a data value displayed using [and] by pressing A U. Deleting a data value causes all values following it to be shifted up. Data values you register are normally stored in calculator memory.

The message "Data Full" appears and you will not be able to input any more data if there is no memory left for data storage. If this happens, press the = key to display the screen shown below. Ed i t OFF ESC 1 2 27 Press 2 to exit data input without registering the value you just input. Press 1 if you want to register the value you just input, without saving it in memory. If you do this, however, you will not be able to display or edit any of the data you have input. To delete data you have just input, press A U. After inputting statistical data in the SD Mode or REG Mode, you will be unable to display or edit individual data items any longer after perform either the following operations.



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Changing to another mode Changing the regression type (Lin, Log, Exp, Pwr, Inv, Quad) Regression Calculations REG Use the F key to enter the REG Mode when you want to perform statistical calculations using regression. REG ..

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. F 3 (fx-95MS) F F 2 (Other Models) · Entering the REG Mode displays screens like the ones shown below. L i n Log Ex p 1 2 3 r e Pw r 1 2 I nv Quad 3 · Press the number key (1, 2, or 3) that corresponds to the type of regression you want to use. 1 (Lin) : Linear regression 2 (Log) : Logarithmic regression 3 (Exp) : Exponential regression r 1 (Pwr) : Power regression r 2 (Inv) : Inverse regression r 3 (Quad) : Quadratic regression 28 · Always start data input with A B 1 (Scl) = to clear statistical memory. · Input data using the key sequence shown below. <x-data> P <y-data> S · The values produced by a regression calculation depend on the values input, and results can be recalled using the key operations shown in the table below. To recall this type of value: Perform this key operation: x2 x n y2 y xy o xn xn-1 p yn yn-1 Regression coefficient A Regression coefficient B Regression calculation other than quadratic regression Correlation coefficient r AU1 AU2 AU3 AUr1 AUr2 AUr3 AX1 AX2 AX3 AXr1 AXr2 AXr3 AXrr1 AXrr2 m n AXrr3 AXrrr1 AXrrr2 · The following table shows the key operations you should use to recall results in the case of quadratic regression. To recall this type of value: Perform this key operation: x3 x2y x4 Regression coefficient C m1 m2 n 29 AUrr1 AUrr2 AUrr3 AXrr3 AXrrr1 AXrrr2 AXrrr3 · The values in the above tables can be used inside of expressions the same way you use variables. u Linear Regression · The regression formula for linear regression is: $y = A + Bx$. · Example: Atmospheric Pressure vs. Temperature Temperature Atmospheric Pressure 10°C 15°C 20°C 25°C 30°C 1003 hPa 1005 hPa 1010 hPa 1011 hPa 1014 hPa Perform linear regression to determine the regression formula terms and correlation coefficient for the data nearby. Next, use the regression formula to estimate atmospheric pressure at 18°C and temperature at 1000 hPa. Finally, calculate the coefficient of determination (r 2) and sample covariance . In the REG Mode: 1(Lin) A B 1 (Scl) = (Stat clear) 10 P1003 S n= REG 1. Each time you press S to register your input, the number of data input up to that point is indicated on the display (n value). 15 P 1005 S 20 P1010 S 25 P 1011 S 30 P 1014 S Regression Coefficient A = 997.4 Regression Coefficient B = 0.56 Correlation Coefficient r = 0.982607368 AXrr1= AXrr2= AXrr3= Atmospheric Pressure at 18°C = 1007.48 18 A X r r r 2 = 30 Temperature at 1000 hPa = 4. 642857143 1000 A X r r r 1 = Coefficient of Determination = 0.965517241 Sample Covariance = 35 AXrr3K= EAUr3, AU3-AXIAXr1F\EAU3,1F= u Logarithmic, Exponential, Power, and Inverse Regression · Use the same key operations as linear regression to recall results for these types of regression. · The following shows the regression formulas for each type of regression. Logarithmic Regression Exponential Regression Power Regression Inverse Regression y y y A B In x A eB·x (In y In A + Bx) A xB (In y In A + B In x) A B 1/x u Quadratic Regression · The regression formula for quadratic regression is: $y = A + Bx + Cx^2$. · Example: Perform quadratic regression to determine the regression formula terms for the data nearby. Next, use the regression formula to estimate the values for n (estimated value of y) for $x_i = 16$ and m (estimated value of x) for $y_i = 20$. x_i 29 50 74 103 118 y_i 1.6 23.5 38.0 46. 4 48.0 In the REG Mode: r 3(Quad) A B 1 (Scl) = (Stat clear) 29 P 1.6 S 50 P 23.5 S 74 P 38.0 S 103 P 46.4 S 118 P 48.0 S 31 Regression Coefficient A = -35.59856934 Regression Coefficient B = 1.495939413 AXrr1= AXrr2= AXrr3= Regression Coefficient C = 6.71629667 i10 3 n when x_i is 16 = 13. 38291067 m1 when y_i is 20 = 47.14556728 m2 when y_i is 20 = 175.5872105 16 A X r r r 3 = 20 A X r r r 1 = 20 A X r r r 2 = Data Input Precautions · S S inputs the same data twice. · You can also input multiple entries of the same data using A G. To input the data "20 and 30" five times, for example, press 20 P 30 A G 5 S.

· The above results can be obtained in any order, and not necessarily that shown above. · Precautions when editing data input for standard deviation also apply for regression calculations. Technical Information k When you have a problem...
... If calculation results are not what you expect or if an error occurs, perform the following steps. 1. Press A B 2(Mode) = to initialize all modes and settings. 2. Check the formula you are working with to confirm it is correct. 3. Enter the correct mode and try performing the calculation again.

If the above steps do not correct the problem, press the 5 key. The calculator performs a self-check operation and deletes all data stored in memory if any abnormality is detected. Make sure you always keep written copies of all important data. k Error Messages The calculator is locked up while an error message is on 32 the display. Press t to clear the error, or press e or r to display the calculation and correct the problem. See "Error Locator" for details. Math ERROR · Causes · Calculation result is outside the allowable calculation range. · An attempt to perform a function calculation using a value that exceeds the allowable input range. · An attempt to perform an illogical operation (division by zero, etc.) · Action · Check your input values and make sure they are all within the allowable ranges.

Pay special attention to values in any memory areas you are using. Stack ERROR · Cause · The capacity of the numeric stack or operator stack is exceeded. · Action · Simplify the calculation. The numeric stack has 10 levels and the operator stack has 24 levels. · Divide your calculation into two or more separate parts.

Syntax ERROR · Cause · An attempt to perform an illegal mathematical operation. · Action · Press e or r to display the calculation with the cursor located at the location of the error and make required corrections. Arg ERROR · Cause · Improper use of an argument 33 · Action · Press e or r to display the location of the cause of the error and make required corrections. k Order of Operations Calculations are performed in the following order of precedence. 1

Coordinate transformation: Pol (x, y), Rec (r,) Differentials: d/dx* Integrations: dx* Normal distribution: P(*, Q(*, R(* 2 Type A functions: With these functions, the value is entered and then the function key is pressed. x3, x2, x 1, x!, ° ' ' Engineering symbols* Normal distribution: t * m, m1, m2, n Angle unit conversions (DRG') Metric conversions** 3 Powers and roots: ^ (xy), x 4 a b/c 5 Abbreviated multiplication format in front of , e (natural logarithm base), memory name, or variable name: 2, 3e, 5A, A, etc.



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@@@** fx-570MS/fx-991MS only. @@exIn 120 ex{In(120)} · Other operations are performed from left to right. · Operations enclosed in parentheses are performed first. · When a calculation contains an argument that is a negative number, the negative number must be enclosed within parentheses. The negative sign () is treated as a Type B function, so particular care is required when the calculation includes a high-priority Type A function, or power or root operations. Example: (2)4 = 16 24 = 16 k Stacks This calculator uses memory areas, called "stacks," to temporarily store values (numeric stack) and commands (command stack) according to their precedence during calculations. The numeric stack has 10 levels and the command stack has 24 levels. A stack error (Stack ERROR) occurs whenever you try to perform a calculation that is so complex that the capacity of a stack is exceeded. · Matrix calculations use up to two levels of the matrix stack.

Squaring a matrix, cubing a matrix, or inverting a matrix uses one stack level. (fx-570MS, fx-991MS only) · Example: 1 123 2 4 3 5 6 4 7 5 Numeric Stack 1 2 2 3 3 4 5 4 5 4 Command Stack 1 2 3 4 5 6 7 35 · Calculations are performed in sequence according to "Order of Operations." Commands and values are deleted from the stack as the calculation is performed. k Input Ranges Internal digits: 12 Accuracy*: As a rule, accuracy is ± 1 at the 10th digit. Functions $\sin x$ DEG 0 RAD 0 GRA 0 $\cos x$ DEG 0 RAD 0 GRA 0 $\tan x$ Input Range $x \times x \times x \times x \times 4.999999999$ 1010 785398163.3 4.999999999 1010 4.500000008 1010 785398164.9 5.

000000009 1010 DEG Same as $\sin x$, except when $x = (2n-1) 90$. RAD Same as $\sin x$, except when $x = (2n-1)/2$. GRA Same as $\sin x$, except when $x = (2n-1) 100$. $\sin 1x \cos 1x \tan x 1 0 0 0 x x x 1 9.999999999$ 1099 230.

2585092 $\sinh x \cosh x x 4.999999999$ 1099 $x 4.999999999$ 1099 $\tanh x 0 x 9.999999999$ 1099 $\tanh 1x 0 x 9.999999999$ 101 $\log x / \ln x 0 x 9.999999999$ 1099 $10x 9.999999999$ 1099 $x 99.99999999$ $ex 9.999999999$ 1099 $x 230.2585092 \cosh 1x 1 \sinh 1x 0 36$ Functions Input Range $0 x x 2 1/x 3 x 1 10100 x x! nPr x 1 1050 x 1 10100 ; x G 0 x 1 10100 0 x 69$ (x is an integer) $0 n 1 1010, 0 r n$ (n, r are integers) $1 0 1 \{n!/(nr!)\} 1 10100 nCr n 1 1010, 0 r n$ (n, r are integers) $[n!/(r!(nr!)] 1 10100 49$ Pol(x, y) $x, y 9.999999999$ 10 (x^2+y^2) 9.999999999 1099 99 Rec($r,) 0 r 9.999999999$ 10 : Same as $\sin x a, b, c 1 10100 \circ " 0 b, c x 1 10100$ Decimal Sexagesimal Conversions $0^\circ 0' 0'' x 9999999^\circ 59' x 0: 1 10100 y \log x 100^{(xy)} x 0: y 0 1 x 0: y n, 2n+1$ (n is an integer) However: $1 10100 y \log x 100 y 0: x G 0 x 1 10100 1/x \log y 100 y y 0: x 0 1 y 0: x 2n 1, n$ ($n G 0; n$ is an integer) However: $1 10100 1/x \log y 100$ Total of integer, numerator, and denominator must be 10 digits or less (including division marks). $a/b/c x 1 1050 y 1 1050 SD n 1 10100$ (REG) $x n, y n, o, p : n G 0 x n 1, y n 1, A, B, r : n G 0, 1 37$ * For a single calculation, calculation error is ± 1 at the 10th digit. (In the case of exponential display, calculation error is ± 1 at the last significant digit.

) Errors are cumulative in the case of consecutive calculations, which can also cause them to become large. (This is also true of internal consecutive calculations that are performed x^3 in the case of $^x(x y), y, x!, nPr, nCr$, etc.) In the vicinity of a function's singular point and point of inflection, errors are cumulative and may become large. Power Supply (fx-95MS only) Users of other models should refer to the "User's Guide 2 (Additional Functions)." This calculator is powered by a single AA-size battery. Replacing the Battery Dim figures on the display of the calculator indicate that battery power is low. Continued use of the calculator when the battery is low can result in improper operation. Replace the battery as soon as possible when display figures become dim. To replace the battery 1 Press A i to turn power off. 2 Remove the six screws that hold the back cover in place and then remove the back cover. 3 Remove the old battery. 4 Load a new battery into the unit with its positive k and negative l ends facing correctly. 5 Replace the back cover and secure it in place with the six screws. 6 Press 5 to turn power on. 38 Screw u Auto Power Off Calculator power automatically turns off if you do not perform any operation for about six minutes.

When this happens, press 5 to turn power back on. Specifications (fx-95MS only) Users of other models should refer to the "User's Guide 2 (Additional Functions)." Power Supply: Single AA-size battery (R6P (SUM-3)) Battery Life: Approximately 17,000 hours continuous display of flashing cursor. Approximately 2 years when left with power turned off. 19. 5 (H) i 78 (W) i 155 (D) mm 3/4 (H) 31/16 (W) 61/8 (D) 130 g (4.6 oz) including battery Dimensions: Weight: Power Consumption: 0.0002 W Operating Temperature: $0^\circ C$ to $40^\circ C$ ($32^\circ F$ to $104^\circ F$) Important notice for fx-912MS owners The names fx-912MS (Japan domestic model name) and fx-115MS (international model name) apply to the same model. Owners of the fx-912MS should refer to the description of fx-115MS. 39 CASIO COMPUTER CO., LTD. 6-2, Hon-machi 1-chome Shibuya-ku, Tokyo 151-8543, Japan SA0206-E Printed China SA0206-D Printed in in China CACA 310067-1 310063-1 .



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