

Owner's Manual

2-lines display Scientific Calculator

with advance statistical functions

Please read before using.

Safety Precautions
Be sure to read the following safety precautions before using this calculator. Keep this manual handy for later reference.

Batteries
• After removing the batteries from the calculator, put them in a safe place where there is no danger of them getting into the hands of small children and accidentally swallowed.
• Keep batteries out of the reach of 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 acid that can cause damage to nearby items and creates the possibility of fire and personal injury.
• Always make sure that a battery's positive (+) and negative (-) sides are facing correctly when you load it into the calculator.
• Remove the batteries if you do not plan to use the calculator for a long time.
• Use only the type of batteries 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 danger of fire and personal injury.
• The displays and illustrations (such as key markings) shown in this Owner's Manual 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.

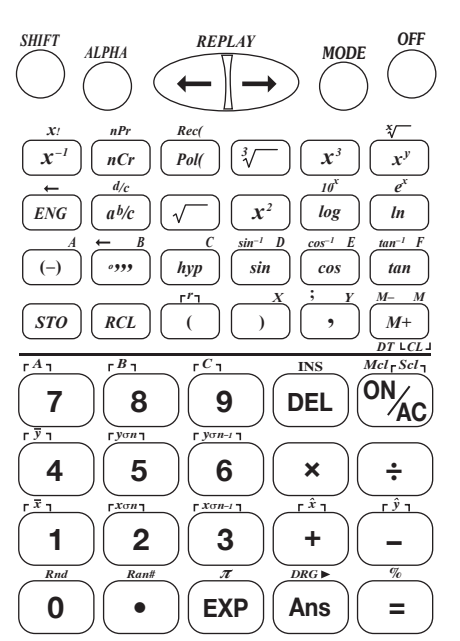
Handling Precautions
• Be sure to press the "ON/AC" key before using the calculator for the first time.
• Even if the calculator is operating normally, replace the battery at least once every three years. Dead battery can leak, causing damage to and malfunction of the calculator. Never leave the dead 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 become 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 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 elements 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 ball-point pen or other pointed object.
• Use a soft, dry cloth to clean the exterior of the unit. 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 damage the case.

Two-lines Display



You can simultaneously check the calculation formula and its answer. The first line displays the calculation formula. The second line displays the answer.

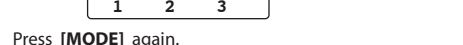
Keys Layout



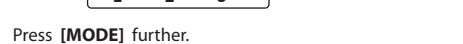
Before Starting Calculations

Operation Modes
When using this calculator, it is necessary to select the proper mode to meet your requirements. This can be done by pressing [MODE] to scroll through sub-menus. Then select the appropriate mode by keying in the number.

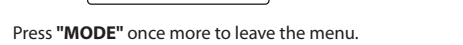
Press [MODE] once to read the first page of the main menu.



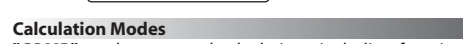
Press [MODE] again.



Press [MODE] further.



Press "MODE" once more to leave the menu.



Calculation Modes
"COMP" mode: general calculations, including function calculations can be executed.
"SD" mode: standard deviation calculation can be executed. "SD" symbol appears in display.
"REG" mode: regression calculations can be performed. "REG" symbol appears in display.

Angular Measurement Modes
"DEG" mode: specify measurement in "degrees". "D" symbol appears in display window.
"RAD" mode: specify measurement in "radians". "R" symbol appears in display window.
"GRA" mode: specify measurement in "grads". "G" symbol appears in display window.

Display Modes
"FIX" mode: specify number of decimal places. "FIX" symbol appears in display window.
"SCI" mode: specify number of significant digits. "SCI" symbol appears in display window.

"NORM" mode: cancels "Fix" and "Sci" specifications.

Note:
• Mode indicators appear in the lower part of the display.
• The "COMP", "SD", and "REG" modes can be used in combination with the angle unit modes.
• Be sure to check the current calculation mode (COMP, SD, REG) and angle unit mode (DEG, RAD, GRA) before beginning a calculation.

Calculation Priority Sequence

Calculations are performed in the following order of precedence:
1. Coordinate transformation: Pol(x, y), Rec(r, θ)
2. Type A functions :-
These functions are those in which the value is entered and then the function key is pressed, such as x², x⁻¹, x!, e^x, 10^x, sin, cos, tan, sin⁻¹, cos⁻¹, tan⁻¹, sinh, cosh, tanh, sinh⁻¹, cosh⁻¹, tanh⁻¹, (-).
3. Powers and roots, x^y, √
4. Fractions, a^b/_c
5. Abbreviated multiplication format in front of n, memory name or variable name, such as 2π, 5A, πA, etc.
6. Type B functions :-
These functions are those in which the function key is pressed and then the value is entered such as √, √, log, ln, e^x, 10^x, sin, cos, tan, sin⁻¹, cos⁻¹, tan⁻¹, sinh, cosh, tanh, sinh⁻¹, cosh⁻¹, tanh⁻¹, (-).
7. Abbreviated multiplication format in front of Type B functions, such as, 2/3, A log₂, etc.
8. Permutation, combination, nPr, nCr
9. X, +, -
10. +, -

• When functions with the same priority are used in series, execution is performed from left to right for > e^{ln}/120 → e^{ln}(ln/120). Otherwise, execution is from left to right.
• Operations enclosed in parentheses are performed first.

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 (stk ERROR) occurs whenever you try to perform a calculation that is so complex that the capacity of a stack is exceeded.

Error Locator
Pressing [◀] or [▶] after an error occurs display the calculation with the cursor positioned at the location where the error occurred.

Overflow and Errors
The calculator is locked up while an error message is on the display. Press [ON/AC] to clear the error, or press [◀] or [▶] to display the calculation and correct the problem.

"Ma ERROR" caused by:
• Calculation result is outside the allowable calculation range.
• Attempt to perform a function calculation using a value that exceeds the allowable input range.
• Attempt to perform an illegal 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.

"Stk ERROR" caused by:
• 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.

"Syn ERROR" caused by:
• Attempt to perform an illegal mathematical operation.
Action
• Press to display the calculation with the cursor located at the location of the error. Make necessary corrections.

Number of Input/output Digits and Calculation Digits
The memory area used for calculation input can hold 79 "steps". One function comprises one step. Each press of numeric or +, -, ×, ÷ keys comprise one step. Though such operations as [SHIFT] [x²] (x² key) require two key operations, they actually comprise only one function, and, therefore, only one step. These steps can be confirmed using the cursor. With each press of the [◀] or [▶] key, the cursor is moved one step.

Whenever you input the 73rd step of any calculation, the cursor changes from " " to " " to let you know memory is running low. If you still need to input more, you should divide your calculation into two or more parts.

When numeric values or calculation commands are input, they appear on the display from the left. Calculation results, however, are displayed from the right.

The allowable input/output range (number of digits) of this unit is 10 digits for a mantissa and 2 digits for the exponent. Calculations, however, are performed internally with a range of 12 digits for a mantissa and 2 digits for an exponent.

Example: 3 × 10⁵ ÷ 7 =



Corrections
To make corrections in a formula that is being input, use the [◀] and [▶] keys to move to the position of the error and press the correct keys.
Example: To change an input of 122 to 123 :-



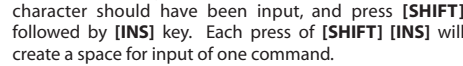
Example: To change an input of cos60 to sin60 :-



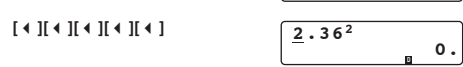
If after making corrections, input of the formula is complete, the answer can be obtained by pressing [=]. If, however, more is to be added to the formula, advance the cursor using the [▶] key to the end of the formula for input.

If an unnecessary character has been included in a formula, use the [◀] and [▶] keys to move to the position of the error and press the "DEL" key. Each press of "DEL" will delete one command (one step).

Example: To correct an input of 369 × × 2 to 369 × 2 :-



Example: To correct an input of 2.36² to sin 2.36² :-



When [SHIFT] [INS] are pressed, the space that is opened is displayed as " ". The function or value assigned to the next key you press will be inserted in the " ". To exit from the insertion mode, move the cursors, or press [SHIFT] [INS], or press [=].

Even after the [=] key has been pressed to calculate a result, it is possible to use this procedure for correction. Press the [◀] key to move the cursor to the place where the correction is to be made.

Arithmetic Operations & Parenthesis Calculations

• Arithmetic operations are performed by pressing the keys in the same order as noted in the formula.
• For negative values, press [-] before entering the value.
• For mixed basic arithmetic operations, multiplication and division are given priority over addition and subtraction
• Assuming that display mode "Norm 1" is selected.

Example	Operation	Display (Lower)
23 + 4.5 - 53 = -25.5	23 [+] 4.5 [-] 53 [=]	-25.5
56 × (-12) ÷ (-2.5) = 268.8	56 [×] [(-)] 12 [÷] [(-)] 2.5 [=]	268.8
12369 × 7532 ÷ 74103 = 6.9036806131 ²	12369 [×] 7532 [÷] 74103 [=]	6.9036806131 ²
(4.5 × 10 ⁹) × (-2.3 × 10 ⁻⁹) = -1.035 × 10 ⁻³	4.5 [EXP] 75 [×] [(-)] 2.3 [EXP] [(-)] 79 [÷] 10 [x ²] [=]	-1.035 -03
(2+3) × 10 ² = 500	(([2] [+] 3)) [×] 10 [x ²] [=]	500.
(1 × 10 ⁹) ÷ 7 = 14285.71429	1 [EXP] 5 [÷] 7 [=]	14285.71429
(1 × 10 ⁹) ÷ 7 - 14285 = 0.7142857	1 [EXP] 5 [÷] 7 [-] 14285 [=]	0.7142857
please note that internal calculation is calculated in 12 digits for a mantissa and the result is displayed and rounded off to 10 digits.		
3 × 5 × 6 = 33	3 [×] 5 [×] 6 [=]	33.
7 × 8 - 4 × 5 = 36	7 [×] 8 [-] 4 [×] 5 [=]	36.
1 + 2 - 3 × 4 ÷ 5 + 6 = 6.6	1 [+] 2 [-] 3 [×] 4 [÷] 5 [+] 6 [=]	6.6
100 - (2+3) × 4 = 80	100 [-] (([2] [+] 3)) [×] 4 [=]	80.
2 + 3 × (4 + 5) = 29	2 [+] 3 [×] (([4] [+] 5)) [=]	29.
Closed parentheses occurring immediately before operation of the [=] key may be omitted.		
(7 - 2) × (8 + 5) = 65	(([7] [-] 2)) [×] (([8] [+] 5)) [=]	65.
A multiplication sign [×] occurring immediately before an open parentheses can be omitted.		
10 - (2 + 7 × (3 + 6)) = -55	10 [-] (([2] [+] 7 [×] ([3] [+] 6)))) [=]	-55.

Percentage Calculations

Use the "COMP" mode for percentage calculations.

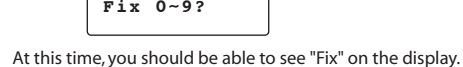
Example	Operation	Display (Lower)
Percentage 26% of \$15.00	15 [×] 26 [SHIFT] [%]	3.9
Ratio 75 is what % of 250?	75 [÷] 250 [SHIFT] [%]	30.

Specifying the Format of Calculation Results
You can change the precision of calculation results by specifying the number of decimal places or the number of significant digits. You can also shift the decimal place of a displayed value three places to the left or right for one-touch conversions of metric weights and measures.

Upon power up reset, the display format is defaulted at "Norm1". Each time when you press "[MODE] [MODE] [MODE] [MODE] [3]" you can choose either "Norm 1" or "Norm 2" by keying in [1] or [2] respectively.
Norm 1 :- all values less than 10⁻² or greater than 10⁹ are automatically expressed as exponents.
Norm 2 :- all values less than 10⁻⁹ or greater than 10⁹ are automatically expressed as exponents.
Note: You cannot specify the display format (Fix, Sci) while the calculator is in Base-N mode.

Specifying the Number of Decimal Places

The calculator always performs calculations using a 10-digit mantissa and 2-digit exponent, and results are stored in memory as a 12-digit mantissa and 2-digit exponent no matter how many decimal places you specify. Intermediate results and final results are then automatically rounded off to the number of decimal places you have specified.
It should be noted that displayed results are rounded to the specified number of decimal places, but stored results are normally not rounded.
To specify the number of decimal places (Fix), press "[MODE] [MODE] [MODE] [1]" and then a value indicating the number of decimal places (0-9).

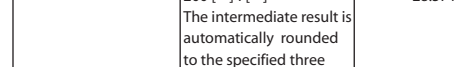
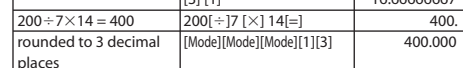
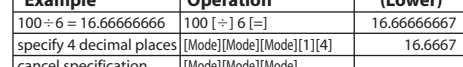


At this time, you should be able to see "Fix" on the display.

The number of decimal places specified will remain in effect until "Norm" (to select "Norm" press "[MODE] [MODE] [MODE] [3]") is specified or significant digits are specified using "[MODE] [MODE] [MODE] [2]".



Reset to "Norm"
[ON/AC] [MODE]



Example	Operation	Display (Lower)
The stored 10-digit result (28.571421857) is used when you continue the calculation by simply pressing [×] or any other arithmetic function key.	[×]	Ans × (upper display)
14 [=] (The final result is automatically rounded to the specified three decimal places.)	14 [=]	400.000
Cancel specification by specifying "Norm" again.	[Mode][Mode][Mode][3][1]	400.

Rounding the Intermediate Result

As the number of decimal places is specified, the intermediate result will be automatically rounded to the specified decimal places. However, the stored intermediate result is not rounded. In order to match the displayed value and the stored value, [SHIFT] [RND] can be input.

You can compare the final result obtained in the previous example with the final result of the following example.

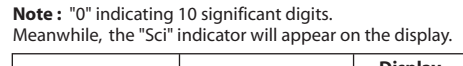
Example	Operation	Display (Lower)
200 ÷ 7 × 14 = 400 rounded to 3 decimal places	200 [÷] 7 [×] 14 [=]	400. 400.000
200 [÷] 7 [=]	200 [÷] 7 [=]	28.571
The intermediate result is automatically rounded to the specified three decimal places. [SHIFT] [RND]	[SHIFT] [RND]	28.571
round the stored intermediate result to the specified three decimal places	[×]	Ans × (upper display) 399.994
14 [=]	14 [=]	399.994
Cancel specification by specifying "Norm" again.	[Mode][Mode][Mode][3][1]	

Specifying the Number of Significant Digits

This specification is used to automatically round intermediate results and final results to the number of digits you have specified.

As with the number of decimal places, displayed results are rounded to the specified number of digits, but stored results are normally not rounded.

To specify the number of significant digits (Sci.), select [SCI] in the sub-menu "FIX/SCI/NORM" and then you are asked to enter a value indicating the number of significant digits (0-9) as below.



Note: "0" indicating 10 significant digits. Meanwhile, the "Sci" indicator will appear on the display.

Example	Operation	Display (Lower)
100 ÷ 6 = 16.66666666	100 [÷] 6 [=]	16.66666667
specify 5 significant digits	[Mode][Mode][Mode][2][5]	1.6667 ⁰¹
Cancel specification by specifying "Norm" again.	[Mode][Mode][Mode][3][1]	16.66666667

Shifting the Decimal Place

You can use the key [ENG] to shift the decimal point of the displayed value three places to the left or right. Each 3-place shift to the left is the same as dividing the value by 1000, and each shift to the right is the same as multiplying by 1000. This means that this function is useful when converting metric weights and measures to other metric units.

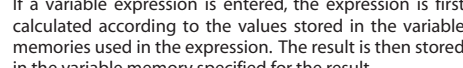
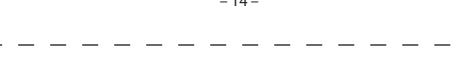
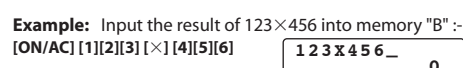
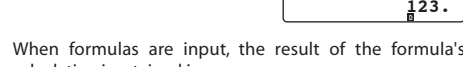
Example	Operation	Display (Lower)
123m × 456 = 56088m = 56.088km	123 [×] 456 [=]	56088. 56.088 ⁰³
78g × 0.96 = 74.88g = 0.07488kg	78 [×] 0.96 [=]	74.88 0.07488 ⁰³

Memory
This calculator contains 9 standard memories. There are two basic types of memories, i.e., "variable" memories, which are accessed by using the [STO] and [RCL] keys in combination with the alphabets A, B, C, D, E, F, M, X and Y. The "independent" memory, which is accessed by using the [M+], [Shift] [M-] and [RCL] and [M] keys. The independent memory uses the same memory area as variable M. Contents of both the variable and independent memories are protected even when the power is turned OFF.

Variable memories

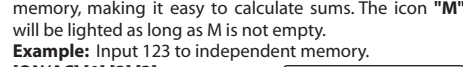
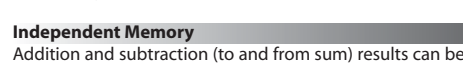
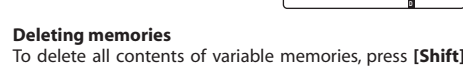
Up to 9 values can be retained in memory at the same time, and can be recalled when desired.

Example: Input 123 into memory "A" :-

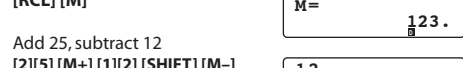
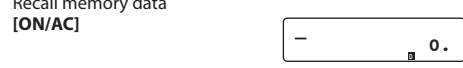


When formulas are input, the result of the formula's calculation is retained in memory.

Example: Input the result of 123 × 456 into memory "B" :-



Recall memory data [ON/AC]

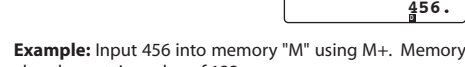
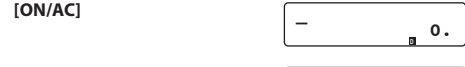


To clear memory contents, press [0] [STO] [M].

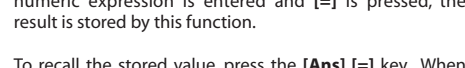
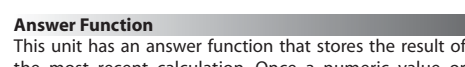
Addition/subtraction to or from sum in memory cannot be carried out with [M+], [Shift] [M-] keys in "SD" mode and "REG" mode.

Difference between [STO] [M] and [M+], [Shift] [M-] :-
Both [STO] [M] and [M+], [Shift] [M-] can be used to input results into memory, however when the [STO] [M] operation is used, previous memory contents are cleared. When either [M+] or [Shift] [M-] is used, value is added or subtracted to or from present sum in memory.

Example: Input 456 into memory "M" using [STO] [M] procedure. Memory already contains value of 123.



Example: Input 456 into memory "M" using M+. Memory already contains value of 123.



Example:
 $4.12 \times 3.58 + 6.4 = 21.1496$
 $4.12 \times 3.58 - 7.1 = 7.6496$
[ON/AC] **[4]** **[*]** **[1]** **[2]** **[*]**
[3] **[*]** **[5]** **[8]** **[+]** **[6]** **[+]** **[4]** **[=]**

4.12 x 3.58 + 6.4 = 21.1496

[4]

-1.2 x 3.58 + 6.4 = 21.1496

[4] **[4]** **[4]** **[4]**

4.12 x 3.58 + 6.4 = 21.1496

[-] **[7]** **[+]** **[1]**

-1.2 x 3.58 - 7.1 = 21.1496

[=]

4.12 x 3.58 - 7.1 = 7.6496

The replay function is not cleared even when **[ON/AC]** is pressed or when power is turned OFF, so contents can be recalled even after **[ON/AC]** is pressed.

Replay function is cleared when mode or operation is switched.

Error Position Display Function

When an **ERROR** message appears during operation execution, the error can be cleared by pressing the **[ON/AC]** key, and the values or formula can be re-entered from the beginning. However, by pressing the **[4]** or **[+]** key, the **ERROR** message is cancelled and the cursor moves to the point where the error was generated.

Example: 14 ÷ 0 × 2.3 is input by mistake

[ON/AC] **[1]** **[4]** **[÷]** **[0]** **[×]**
[2] **[1]** **[3]** **[=]**

Ma ERROR

[4] (or **[+]**)

140 x 2.3 = 0.

Correct the input by pressing **[4]** **[SHIFT]** **[ANS]** **[1]**

1410 x 2.3 = 0.

[=]

1410 x 2.3 = 3.22

Scientific Function

Trigonometric functions and inverse trigonometric functions

- Be sure to set the unit of angular measurement before performing trigonometric function and inverse trigonometric function calculations.
- The unit of angular measurement (degrees, radians, grads) is selected in sub-menu.
- Once the unit of angular measurement is set, it remains in effect until a new unit is set. Settings are not cleared when power is switched OFF.

Example **Operation** **Display (Lower)**

sin 63°52'41" **[MODE]****[MODE]****[1]** **[°DEG** selected) **[sin]** **63** **[° "** **"]** **52** **[° "** **"]** **41** **[° "** **"]** **[=]** 0.897859012

cos (π/3 rad) = 0.5 **[MODE]****[MODE]****[2]** **[RAD** selected) **[cos]** **[π]** **[SHIFT]** **[π]** **[÷3]** **[)]** **[=]** 0.5

tan (-35 grad) **[MODE]****[MODE]****[3]** **[GRA** selected) **[tan]** **[(-)]** **35** **[=]** -0.612800788

2sin45° × cos65° **[MODE]****[MODE]****[1]** **[°DEG** selected) **[2]** **[sin]** **45** **[cos]** **65** **[=]** 0.597672477

sin⁻¹ 0.5 = 30 **[SHIFT]** **[sin]** **[⁻¹]** **0.5** **[=]** 30.

cos⁻¹ (√2/2) **[MODE]****[MODE]****[2]** **[RAD** selected) **[cos]** **[√]** **[2]** **[÷]** **2** **[)]** **[=]** 0.785398163

tan⁻¹ 0.741 **[MODE]****[MODE]****[1]** **[°DEG** selected) **[tan]** **[⁻¹]** **0.741** **[=]** 36.538445576

2.5 × (sin⁻¹ 0.8 - cos⁻¹ 0.9) **[2.5]** **[×]** **[(]** **[SHIFT]** **[sin]** **[⁻¹]** **0.8** **[⁻]** **[SHIFT]** **[cos]** **[⁻¹]** **0.9** **[)]** **[=]** 68°13'13.53"

If the total number of digits for degrees/minutes/seconds exceed 11 digits, the higher order values are given display priority, and any lower-order values are not displayed. However, the entire value is stored within the unit as a decimal value.

68°13'13.53" **[MODE]****[MODE]****[1]** **[°DEG** selected) **[68]** **[°]** **[13]** **[']** **[13.53]** **["]** **[=]** 68°13'13.53"

Performing Hyperbolic and Inverse Hyperbolic Functions

Example **Operation** **Display (Lower)**

sinh3.6 = 18.28545536 **[hyp]** **[sin]** **3.6** **[=]** 18.28545536

cosh1.23 = 1.856761057 **[hyp]** **[cos]** **1.23** **[=]** 1.856761057

tanh2.5 = 0.986614298 **[hyp]** **[tan]** **2.5** **[=]** 0.986614298

sinh⁻¹ 5 = sinh 1.5 **[hyp]** **[cos]** **1.5** **[⁻¹]** **[hyp]** 0.22313016

sinh⁻¹ 30 = 4.094622224 **[hyp]** **[sin]** **[⁻¹]** **30** **[=]** 4.094622224

cosh⁻¹ (20/15) **[hyp]** **[SHFT]** **[cos]** **[⁻¹]** **20** **[÷]** **15** **[)]** **[=]** 0.795365461

x = (tanh⁻¹ 0.88) / 4 **[hyp]** **[SHFT]** **[tan]** **[⁻¹]** **0.88** **[÷]** **4** **[=]** 0.343941914

sinh⁻¹ 2 × cosh⁻¹ 1.5 **[hyp]** **[SHFT]** **[sin]** **[⁻¹]** **2** **[×]** **[hyp]** **[SHFT]** **[cos]** **[⁻¹]** **1.5** **[=]** 1.389388923

sinh⁻¹ (2/3) + tanh⁻¹ (4/5) **[hyp]** **[SHFT]** **[sin]** **[⁻¹]** **(2** **[÷]** **3)** **[+]** **[hyp]** **[SHFT]** **[tan]** **[⁻¹]** **(4** **[÷]** **5)** **[)]** **[=]** 1.723757406

Logarithmic and Exponential Functions

Example **Operation** **Display (Lower)**

log 1.23 **[log]** **1.23** **[=]** 0.089905111

ln90 = 8.9905111 × 10⁻² **[ln]** **90** **[=]** 0.089905111

log456 ÷ ln456 **[log]** **456** **[÷]** **[ln]** **456** **[=]** 0.434294481

10²² = 16.98243652 **[SHIFT]** **[10^x]** **2.23** **[=]** 16.98243652

e^{4.5} = 90.0171313 **[SHIFT]** **[e^x]** **4.5** **[=]** 90.0171313

10⁴ × e⁻⁴ + 1.2 × 10²³ **[SHIFT]** **[10^x]** **4** **[×]** **[SHIFT]** **[e^x]** **[⁻]** **4** **[+]** **[1.2]** **[×]** **[SHIFT]** **[10^x]** **23** **[=]** 422.5878667

(-3)⁴ = 81 **[(-)]** **[3]** **[)]** **[x⁴]** **[=]** 81.

-3⁴ = -81 **[(-)]** **[3]** **[x⁴]** **[=]** -81.

5.6^{3.3} = 52.58143837 **5.6** **[x^y]** **2.3** **[=]** 52.58143837

⁷√123 = 1.988647795 **7** **[SHIFT]** **[√^x]** **123** **[=]** 1.988647795

(78 - 23)¹² **(78** **-** **23)** **[)]** **[x¹²]** **[=]** 1.305111829 × 10²¹

2 + 3 × ⁴√64 - 4 = 10 **2** **[+]** **3** **[×]** **4** **[√]** **64** **-** **4** **[=]** 10.

2 × 3.4^{16.7} = 3306232 **2** **[×]** **3.4** **[x^y]** **(25** **+]** **6.7)** **[=]** 3306232.001

Coordinate Transformation

- This scientific calculator lets you convert between rectangular coordinates and polar coordinates, i.e., P(x, y) ↔ P(r, θ)
- Calculation results are stored in variable memory E and variable memory F. Contents of variable memory E are displayed initially. To display contents of memory F, press **[RCL]** **[F]**.
- With polar coordinates, θ can be calculated within a range of -180° < θ ≤ 180°.

(Calculated range is the same with radians or grads.)

Example **Operation** **Display (Lower)**

x=14 and y=20.7, what are r and θ?
[Pol] **(14** **[,]** **20.7)** **[)]** **[=]** 24.98979792(r)

x=7.5 and y=-10, what are r and θ?
[Pol] **(7.5** **[,]** **(-)** **10)** **[)]** **[=]** 12.5(r)

r=25 and θ=56°, what are x and y?
[Rec] **(25** **[,]** **56)** **[)]** **[=]** 13.97982259(x)

r=4.5 and θ=2/3 rad, what are x and y?
[Rec] **(4.5** **[,]** **(2** **÷]** **3)** **[)]** **[=]** -2.25(x)

Permutation and Combination

Total number of permutations nPr = n!/(n-r)!

Total number of combinations nCr = n!/(r!(n-r)!) **10** **[SHIFT]** **[nPr]** **4** **[=]** 5040.

Taking any four out of ten items and arranging them in a row, how many different arrangements are possible?
10Pr4 = 5040

Example **Operation** **Display (Lower)**

Taking any four out of ten items and arranging them in a row, how many different arrangements are possible?
10Pr4 = 5040

Example	Operation	Display (Lower)
Using any four numbers from 1 to 7, how many four digit even numbers can be formed if none of the four digits consist of the same number? (3/7 of the total number of permutations will be even.) 7P4 × 3 ÷ 7 = 360	7 [SHIFT] [nPr] 4 [×] 3 [÷] 7 [=]	360.
If any four items are removed from a total of 10 items, how many different combinations of four items are possible? 10C4 = 210	10 [nCr] 4 [=]	210.
If 5 class officers are being selected for a class of 15 boys and 10 girls, how many combinations are possible? At least one girl must be included in each group. 25C5 - 15C5 = 50127	25 [nCr] 5 [=] - 15 [nCr] 5 [=]	50127.

Other Functions (√, x², x⁻¹, x!, 2^x, Ran#)

Example	Operation	Display (Lower)
√2 + √5 = 3.65028154	√ 2 [+] √ 5 [=]	3.65028154
2 ² + 3 ² + 4 ² + 5 ² = 54	2 [x²] [+] 3 [x²] [+] 4 [x²] [+] 5 [x²] [=]	54.
(-3) ² = 9	(- 3) [x²] [=]	9.
1/(1/3 - 1/4) = 12	1 (3 - 1) [x⁻¹] - 1 (4 - 1) [x⁻¹] [=]	12.
8! = 40320	8 [SHIFT] [x!] [=]	40320.
³ √(36 × 42 × 49) = 42	√ (36 × 42 × 49) [=]	42.
Random number generation (number is in the range of 0.000 to 0.999)	[SHIFT] [Ran#] [=]	0.792 (random)

Regression Calculation

In the REG mode, calculations including linear regression, logarithmic regression, exponential regression, power regression, inverse regression and quadratic regression can be performed.

Press **[MODE]** **[3]** to enter the "REG" mode:

COMP **SD** **REG**
1 **2** **3**

and then select one of the following regression types:-

Lin **Log** **Exp** **-**
1 **2** **3**

Lin: linear regression
 Log: logarithmic regression
 Exp: exponential regression

press **[+]** for the other three regression types:-

-Pwr **In** **Quad**
1 **2** **3**

Fractions

Fractions are input and displayed in the order of integer, numerator and denominator. Values are automatically displayed in decimal format whenever the total number of digits of a fractional value (integer + numerator + denominator + separator marks) exceeds 10.

Example	Operation	Display (Lower)
√5 + 3/4 = 3 ¹³ /20	2 [a^b/c] 5 [+] 3 [a^b/c] 4 [=]	3.13,20
1/2! + 1/4! + 1/6! + 1/8! = 0.543080357	1 [a^b/c] 2 [!] [+] 1 [a^b/c] 4 [!] [+] 1 [a^b/c] 6 [!] [+] 1 [a^b/c] 8 [!] [=]	0.543080357
3 ⁴⁵⁶ / 78 = 8 ¹¹ / 13	3 [a^b/c] 456 [a^b/c] 78 [=]	8,11,13
1/2578 + 1/4572 = 0.00060662	1 [a^b/c] 2578 [+] 1 [a^b/c] 4572 [=]	6.066202547 ⁻⁰⁴
1/2 × 0.5 = 0.25	1 [a^b/c] 2 [×] 0.5 [=]	0.25
1/3 × (-4/5) = 5/6 = -1/10	1 [a^b/c] 3 [×] (-) 4 [a^b/c] 5 [=]	-1,1,10
1/2 × 1/3 + 1/4 × 1/5 = 13/60	1 [a^b/c] 2 [×] 1 [a^b/c] 3 [+] 1 [a^b/c] 4 [×] 1 [a^b/c] 5 [=]	13,60
(1/2)/3 = 1/6	(1 [a^b/c] 2) [a^b/c] 3 [=]	1,6
1/(1/3 + 1/4) = 1 5/7	1 [a^b/c] (1 [a^b/c] 3 [+] 1 [a^b/c] 4) [=]	1,5,7

Degree, Radian, Gradient Interconversion

Degree, radian and gradient can be converted to each other with the use of **[SHIFT]** **[DRG>]**. Once **[SHIFT]** **[DRG>]** have been keyed in, the "DRG" selection menu will be shown as follows.

D **R** **G**
1 **2** **3**

Example	Operation	Display
Define degree first	[MODE] [MODE] [1] [°DEG selected)	
Change 20 radian to degree	20 [SHIFT] [DRG>] [2] [=]	20°
To perform the following calculation: 10 radians ÷ 25.5 gradients. The answer is expressed in degree.	10 [SHIFT] [DRG>] [2] [÷] 25.5 [SHIFT] [DRG>] [3] [=]	10° + 25.5° 595.9077951

Degrees, Minutes, Seconds Calculations

You can perform sexagesimal calculations using degrees (hours), minutes and seconds. And convert between sexagesimal and decimal values.

Example	Operation	Display
To express 2.258 degrees in deg/min/sec.	2.258 [°] [=]	2°15'28.8"
To perform the calculation: 12°34'56" × 3.45	12 [°] 34 ['] 56 ["] [×] 3.45 [=]	43°24'31.2"

Statistical Calculations

This unit can be used to make statistical calculations including standard deviation in the "SD" mode, and regression calculation in the "REG" mode.

Standard Deviation

In the "SD" mode, calculations including 2 types of standard deviation formulas, mean, number of data, sum of data, and sum of square can be performed.

Data input

1. Press <