

# Canon

## F-605G

Scientific Calculator

CALCULATION  
EXAMPLES

**EN**

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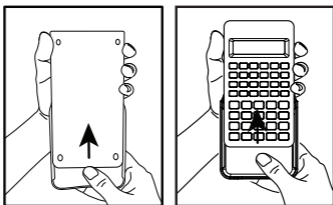


## IMPORTANT: READ BEFORE USE

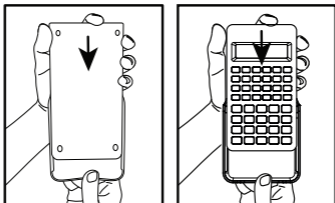
Please read the following instructions and safety precautions before using the Scientific Calculator. Keep this manual on hand for future reference.

## HOW TO OPEN / CLOSE THE COVER

Open or close the cover by sliding as shown in the figures.

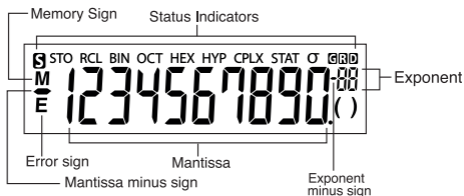


OPEN



CLOSE

# DISPLAY



- S** : Shift Key
- STO : Store Memory
- RCL : Recall Memory
- BIN : Binary Mode
- OCT : Octal Mode
- HEX : Hexadecimal Mode
- HYP : Hyperbolic
- CPLX : Complex Mode
- STAT : Statistics Mode
- $\sigma$  : Standard Deviation of Population
- G** : Gradient Mode
- D** : Degree Mode
- R** : Radian Mode

**Note:** For possible errors, see page 25 "Errors".

**Examples:**

Fraction (e.g.  $1\frac{2}{5}$ ):

1.25

Hexadecimal numbers A ~ F:

ABCDEF

# GETTING STARTED

## 1. Check the Current Calculation Mode

Be sure to check the status indicators that indicate the current calculation mode (DEG, BIN, STAT and CPLX) and display formats setting (Floating mode).

**Note!** If you get into trouble, hold  $\overline{\text{SHIFT}}$  +  $\bullet$ RESET to reset the calculator.

## 2. Key Symbols

**Example** ( $\overline{\text{sin}}^{\text{D}}$ ):

$\overline{\text{sin}}$  To use a function printed on a key, press the key.

$\overline{\text{sin}}^{-1}$  To use a function printed above a key, press the  $\overline{\text{SHIFT}}$  key while in decimal mode.

$\overline{\text{D}}$  The "D" key is colored in gray.  
To use a function printed above a key in gray, press the  $\overline{\text{SHIFT}}$  key while in Hexadecimal mode.

### **Note:**

The blue keys are active in Statistic mode only. In Statistic mode ("STAT" indicator lights up), they work as follows.

**Example** ( $\overline{\text{Σx}}$ ):

$\overline{n}$  Calculate the number of data samples when it is pressed.

$\overline{\text{Σx}}$  **2nd function key:** Calculate the summation of "Σx" data were input when it is pressed immediately after  $\overline{\text{SHIFT}}$ .

## Power ON, OFF

### ■ First time operation:

1. Pull out the battery insulation sheet, then the battery will be loaded and the calculator can be powered on.
2. Hold  $\overline{\text{SHIFT}}$  +  $\bullet\text{RESET}$  to reset the calculator.

$\overline{\text{ON}}$   
 $\text{CA}$

**Power ON/Clear Key:** Turns the calculator on. When power is turned on, all registers except the memory registers are cleared.

$\overline{\text{SHIFT}}$  +  $\text{OFF}$

**Power OFF Key:** Turns the calculator off.

$\text{CE}$

**Clear Entry Key:** Clears the content just entered.

$\overline{\text{SHIFT}}$  +  $\bullet\text{RESET}$

**Reset Key:** Reset the calculator when these keys are pressed. The memory is cleared, and the calculation mode is reset to Decimal Calculation (Floating mode).

### Auto Power Off Function

When the calculator is not used for about 7 minutes, the calculator will automatically power off.

## Numeric Entry and Mode Selection Keys

**0** ~ **9** **Numeric Keys:** Enters numbers.

**▣** **Decimal Point Key:** Enters a decimal point.

**EXP** **Exponential Key:** Uses to enter exponents.

**Example:**  $35 \times 10^{43} \rightarrow$  **3** **5** **EXP** **4** **3** (35.<sup>43</sup>)

**(-)** **Sign Change Key:** For changing the sign (+ or -) of the displayed mantissa or exponents.

**Example:** 123  $\rightarrow$  **1** **2** **3** **(-)** (-123.)

**▶** **Backspace Key:** Clears the last digit entered and shifts any remaining digits one place to the right.

**Example:**













Value	Operation	Display
12345	<b>1</b> <b>2</b> <b>4</b> incorrect entry	124.
	<b>▶</b>	12.
	<b>3</b> <b>4</b> <b>5</b>	12345.

**SHIFT**  
**▣** **Shift Key:** For performing second functions indicated above the keys.

**Example:**  $\sin^{-1} 0.5 \rightarrow$  **▣** **5** **SHIFT** **sin<sup>-1</sup>** (30.)



## Mode Selection


To specify the calculation mode:

Operation	Mode	Display Indicator
 	Decimal Calculation (Degree) Mode	D
 	Binary Calculation Mode	BIN
 	Octal Calculation Mode	OCT
 	Hexadecimal Calculation Mode	HEX
 	Statistical Calculation Mode	STAT
 	Complex Number Calculation Mode	CPLX















## Display Mode Keys

 : Engineering Exponential mode.

  : Return to previous mode from Engineering Exponential mode.

 : Switch between Floating mode and Scientific Exponential mode.

## Example:

Operation	Display	Explanation
	0.	Floating Mode
   		
  	1230.	
	$1.23^{03}$	Scientific Exponential Mode
	$1.23^{03}$	Engineering Exponential Mode
	$1230.^{00}$	
	$1230000.^{-03}$	
  	$1230.^{00}$	Reverse Engineering Exponential



## Display Range:

Floating Mode

$10^{10} \leq |x| < 10^{100}$  For exponential display

$10^{-99} \leq |x| < 10^{-9}$  For exponential display

$x = 0$  or  $10^{-9} \leq |x| < 10^{10}$  For mantissa display

- Scientific Exponential Mode  
 $x = 0$ , and  $10^{-99} \leq |x| < 10^{100}$
- Engineering Exponential Mode  
 $x = 0$ , and  $10^{-99} \leq |x| < 10^{100}$   
Exponent: Multiple of 3

## Decimal Point Selection Key

**FIX**  
 Specify the number of decimal places in the mantissa of the decimal calculation results.

Press  **0** ~  **9** after  **SHIFT**  **FIX** to specify the number of decimal places.

**Note!** To reset the decimal places, press  **SHIFT** ,  
 **FIX** , then  **■** .

## Example:

Operation	Display	Explanation
<input type="text"/> <b>SHIFT</b> <input type="text"/> <b>FIX</b> <input type="text"/> <b>3</b>	0.000	3 decimal places
<input type="text"/> <b>1</b> <input type="text"/> <b>2</b> <input type="text"/> <b>3</b>		
<input type="text"/> <b>4</b> <input type="text"/> <b>5</b> <input type="text"/> <b>6</b>		
<input type="text"/> <b>7</b> <input type="text"/> <b>8</b> <input type="text"/> <b>9</b>		
<input type="text"/> <b>x</b>	123456789.0	
<input type="text"/> <b>■</b> <input type="text"/> <b>0</b> <input type="text"/> <b>0</b>		
<input type="text"/> <b>1</b> <input type="text"/> <b>=</b>	123456.789	
<input type="text"/> <b>SHIFT</b> <input type="text"/> <b>FIX</b> <input type="text"/> <b>0</b>	123457. <sup>(*1)</sup>	0 decimal places
<input type="text"/> <b>SHIFT</b> <input type="text"/> <b>FIX</b> <input type="text"/> <b>5</b>	123456.7890 <sup>(*2)</sup>	5 decimal places
<input type="text"/> <b>SHIFT</b> <input type="text"/> <b>FIX</b> <input type="text"/> <b>■</b>	123456.789	Reset decimal places

- \*1 The displayed value is rounded up within the specified range, but the actual calculation result is retained in the register.
- \*2 The number is displayed with left justification. In this case, 5 decimal places are specified, but only the 10 most significant digits are displayed. The 5th decimal place is not displayed.

## Degree / Radian / Gradient Mode Key

**DRG** Change angle units.

**SHIFT** **DRG** **Angle Unit Conversion Mode:** For converting angle values to different units. (DEG → RAD → GRAD)

• Relationship of units:  $200^{\text{GRAD}} = 180^{\circ} = \pi^{\text{RAD}}$

**Example (in Degree mode):**

**1** **8** **0** **SHIFT** **DRG** ( 3.141592654<sup>R</sup> )

## Basic Calculation Keys



**Arithmetic Keys:** Uses for basic arithmetic calculation.

%



**Percent key:** Uses for percentage, add-on and discount calculations.

**Example:** (1.23)

**Open, Close Parenthesis Keys**

**Example:**

Value	Operation	Display
$2 \times (3 + 4) = 14$		14.
$1 + [(4 - 3.6 + 5) \times 0.8 - 6] \times 4.2 = -6.056$		- 6.056

- Up to 15 consecutive open parentheses can be used at one time.

**Example:**  $5 \times ( ( ( \dots ( (4 + 2) \times 3) + 8 \dots$

Up to 15 parentheses

- are always used together. If either key is pressed alone during an operation, the intended result cannot be obtained.
- key is effective only when pressed immediately after a calculation instruction.
- When is effective, "0" will be displayed. Parentheses indicators ( ) appear on the display.

## Fraction Calculation Keys

**$\boxed{a\frac{b}{c}}$  Fraction Key:** Use this key to enter both mixed and improper fractions.

$\frac{d}{c}$ : d (numerator)  $\rightarrow$   $\boxed{a\frac{b}{c}}$   $\rightarrow$  c (denominator).

$a\frac{b}{c}$ : a (integer)  $\rightarrow$   $\boxed{a\frac{b}{c}}$   $\rightarrow$  b (numerator)  $\rightarrow$   $\boxed{a\frac{b}{c}}$   $\rightarrow$  c (denominator)

■ The fraction  $\frac{2}{3}$  is displayed as "2┘3", and  $1\frac{2}{5}$  as "1┘2┘5".

### Example:

Value	Operation	Display
$\frac{2}{3}$	$\boxed{2}$	2.
	$\boxed{a\frac{b}{c}}$	2┘.
	$\boxed{3}$	2┘3.
$1\frac{2}{5}$	$\boxed{1}$	1.
	$\boxed{a\frac{b}{c}}$	1┘.
	$\boxed{2}$	1┘2.
	$\boxed{a\frac{b}{c}}$	1┘2┘.
	$\boxed{5}$	1┘2┘5.

### Note!

- Fraction calculation results will be displayed in decimal format automatically whenever the total digits of a fractional value (integer + numerator + denominator + separator marks) exceeds 10.
- $\boxed{a\frac{b}{c}}$  can convert the results of fractional calculations to decimal notation, and vice versa.

**Example:** Calculate  $1\frac{2}{3} + 4\frac{5}{6}$  and convert the result to a decimal fraction.

Operation	Display
1 $\frac{a}{b}{c}$ 2 $\frac{a}{b}{c}$ 3 +	1 ▯ 2 ▯ 3.
4 $\frac{a}{b}{c}$ 5 $\frac{a}{b}{c}$ 6 =	6 ▯ 1 ▯ 2.
$\frac{a}{b}{c}$	6.5
$\frac{a}{b}{c}$	6 ▯ 1 ▯ 2.

$\frac{\text{SHIFT}}{\square}$   $\frac{d}{c}$  **Mixed / Improper Fraction Conversion Key:**  
 It converts mixed fractions to improper fractions and vice versa. It changes alternatively each time the key is pressed.

**Example:** Enter  $\frac{10}{3}$  and convert it to a mixed fraction.

Operation	Display
1 0 $\frac{a}{b}{c}$ 3	10 ▯ 3.
=	3 ▯ 1 ▯ 3.
$\frac{\text{SHIFT}}{\square}$ $\frac{d}{c}$	10 ▯ 3.

## Memory Keys

**Independent Memory:** The data in the independent memory is retained even when the calculator is turned off.

**M+** **M-** **Memory Plus and Minus Key:** Add or Subtract numbers to the independent memory.

**MR** **Memory Recall Key:** Retrieve the value of the independent memory.

**X→M** **Exchange Memory By Display Value:** Replaces the displayed number with the contents of the independent memory.

**Memory Variables:** You can assign a specific value or a calculation result to a variable. There are 6 memory variables (A, B, C, D, E and F) to store data, results, or dedicated values.

**STO** **Store Values Key:** To store variable into memory.

**RCL** **Recall Values Key:** To recall the memory variable.

**Example: Using the independent memory:**

Operation	Display	Memory contents	Explanation
<b>1</b> <b>2</b> <b>3</b>	123.	0	Enter 123
<b>M+</b>	M 123.	123	Store 123
<b>4</b> <b>5</b> <b>6</b> <b>M+</b>	M 456.	579	Add 456
<b>MR</b>	M 579.	579	Recall from memory
<b>7</b> <b>8</b> <b>9</b>	M 789.	579	Enter 789
<b>X→M</b>	M 789.	789	Replace memory with display
<b>ON</b> <b>CA</b>	M 0.	789	Clear display
<b>X→M</b>	0.	0	Clear memory

## Example: Using the memory variable

Operation	Display	Memory contents	Explanation
1 2 × 3 =	36.	0	Enter value
SHIFT STO A	36.	36	Store value to variable A
4 5 + 6 =	51.	0	Enter value
SHIFT STO C	51.	51	Store value to variable C
ON CA	0.	A= 36 C= 51	Clear display
RCL A	36.	36	Recall the contents of variable A
RCL C	51.	51	Recall the contents of variable C

## Binary / Octal / Hexadecimal Number Keys

SHIFT +  DEC /  BIN /  OCT /  HEX : To specify the numbering system as Decimal / Binary / Octal / Hexadecimal.

**Binary Number Entry Keys:**  0 ~  1

2 ~  9 are ignored in Binary mode.

**Octal Number Entry Keys:**  0 ~  7

8 and  9 are ignored in Octal mode.

**Hexadecimal Number Entry Keys (0~9):**  0 ~  9

**Hexadecimal Number Entry Keys (10~15):**

<sup>A</sup> ~  <sup>F</sup>

**Example:**

Value	Operation	Display
AB7C	<input type="checkbox"/> SHIFT <input type="checkbox"/> ▶ HEX <input type="checkbox"/> <sup>A</sup> <input type="checkbox"/> <sup>B</sup> <input type="checkbox"/> 7 <input type="checkbox"/> <sup>C</sup>	(HEX.) Ab7C.

## Random Number Generation

Rand **Random Key:** To generate a random number  
 \* The value being generated will differ each time between 0.000 and 0.999.

**Example:**  SHIFT  Rand (0.132)\*



## Complex Number Calculation

**SHIFT** **CPLX** : To enter complex mode.

**a** **Real Part Key:** For storing the real number in Complex mode.

**b** **Imaginary Part Key:** For storing the imaginary number in Complex mode.

**Example:**

Value	Operation	Display
$(12 - 3i) - (4 + 7i)$  $= 8 - 10i$	<b>SHIFT</b> <b>CPLX</b> <b>1</b> <b>2</b> <b>a</b> <b>3</b> <b>(-)</b> <b>b</b> <b>(-)</b> <b>4</b> <b>a</b> <b>7</b> <b>b</b> <b>=</b> <b>b</b>	(CPLX)   8. -10.
$(6 - 7i) \times (-8 + 9i)$  $= 15 + 110i$	<b>6</b> <b>a</b> <b>7</b> <b>(-)</b> <b>b</b> <b>x</b> <b>8</b> <b>(-)</b> <b>a</b> <b>9</b> <b>b</b> <b>=</b> <b>b</b>	   15. 110.

### Rectangular $\leftrightarrow$ Polar Conversion

See P.36 "Basic Function Calculations".

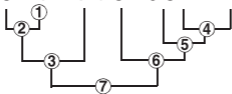
### 3. Order Of Operations

The calculator will automatically determine the operation priority of each individual command as follows:

#### HIGHEST PRIORITY

1. Calculation within parentheses ( ).
2. Exponent (EXP):
3. Function keys:  
 $x^3$ ,  $x^2$ ,  $x^{-1}$ ,  $x!$ ,  $\circ$ ,  $\circ$ ,  $\circ$ ,  $\circ$ ,  $\circ$ ,  $\circ$ ,  $\circ$   
 Angle unit conversions (DRG  $\blacktriangleright$ , DRG)  
 $\sqrt{\quad}$ ,  $\sqrt[3]{\quad}$ ,  $\log$ ,  $\ln$ ,  $e^x$ ,  $10^x$ ,  
 $\sin$ ,  $\cos$ ,  $\tan$ ,  $\sin^{-1}$ ,  $\cos^{-1}$ ,  $\tan^{-1}$ ,  $\sinh$ ,  $\cosh$ ,  $\tanh$ ,  
 $\sinh^{-1}$ ,  $\cosh^{-1}$ ,  $\tanh^{-1}$
4. Fractions (ab/c, d/c)
5. Negative value ((-))
6. Powers and roots:  $x^y$ ,  $x\sqrt{\quad}$
7. Permutations (nPr) and combinations (nCr)
8.  $\times$ ,  $\div$
9.  $+$ ,  $-$

**Example:**  $5 \div 4^2 \times 7 + 3 \times 0.5^{\cos 60^\circ} = 4.308820344$



#### Levels of calculations (Stack Memory)

During actual calculation, lower precedence calculations are stored in the stack memory and then processed in turn. This stack memory can store up to 5 levels of calculations.

**Example:**  $1 + 2 \times (\sin 30^\circ + 6 \times (2 + 3 \times 2.2)) = 105.2$







## 5. Statistical Calculations

### Basic procedure

- Press  $\overline{\text{SHIFT}}$   $\overline{\text{STAT}}$ . The "STAT" indicator lights up.
- Enter the first data and press  $\overline{\text{Data}}$ .
- After entering the data, press the statistical calculation keys (e.g.  $\overline{s}$ ,  $\overline{\bar{x}}$  ...).
- Press  $\overline{\text{SHIFT}}$   $\overline{\text{STAT}}$  to exit the statistical calculation mode and clear the statistical calculation memory.

### Example:

Operation	Display	Explanation
$\overline{\text{ON CA}}$ $\overline{\text{SHIFT}}$ $\overline{\text{STAT}}$	(STAT) 0.	Statistic mode
$\overline{1}$ $\overline{0}$	10.	Enter 10
$\overline{\text{Data}}$	1.	Data 1 entry
$\overline{2}$ $\overline{0}$	20.	Enter 20
$\overline{\text{Data}}$	2.	Data 2 entry
$\overline{3}$ $\overline{0}$	30.	Enter 30
$\overline{\text{Data}}$	3.	Data 3 entry
$\overline{4}$ $\overline{0}$	40.	Enter 40
$\overline{\text{Data}}$	4.	Data 4 entry
$\overline{5}$ $\overline{0}$ $\overline{=}$	50.	Enter 50
$\overline{\text{Data}}$	5.	Data 5 entry
$\overline{\bar{x}}$	30.	Mean of x
$\overline{n}$	5.	Total number of data sample
$\overline{s}$	15.8113883.	Sample Standard Deviation of x
$\overline{\text{SHIFT}}$ $\overline{[\Sigma x]}$	150.	Summation of x
$\overline{\text{SHIFT}}$ $\overline{[\Sigma x^2]}$	5500.	Sum of Square of the value
$\overline{\text{SHIFT}}$ $\overline{[\sigma]}$	14.14213562.	Population of Standard Deviation of x
$\overline{\text{SHIFT}}$ $\overline{[\min x]}$	10.	The min data
$\overline{\text{SHIFT}}$ $\overline{[\max x]}$	50.	The max data

## Add / Delete Statistical Data

- Use  Data and  SHIFT  [CD]

### Example: Add LCD current display

Operation	Display	Explanation
<input type="text"/> SHIFT <input type="text"/> STAT <input type="text"/>	(STAT) 0.	Statistic mode
<input type="text"/> 1 <input type="text"/> 0 <input type="text"/>	10.	Enter 10
<input type="text"/> Data	1.	Data 1 entry
<input type="text"/> 2 <input type="text"/> 0 <input type="text"/>	20.	Enter 20
<input type="text"/> Data	2.	Data 2 entry
<input type="text"/> Data	3.	Data 3 entry

### Example: Delete LCD display

Operation	Display	Explanation
<input type="text"/> SHIFT <input type="text"/> STAT <input type="text"/>	(STAT) 0.	Statistic mode
<input type="text"/> 1 <input type="text"/> 0 <input type="text"/>	10.	Enter 10
<input type="text"/> Data	1.	Data 1 entry
<input type="text"/> 2 <input type="text"/> 0 <input type="text"/>	20.	Enter 20
<input type="text"/> Data	2.	Data 2 entry
<input type="text"/> 3 <input type="text"/> 0 <input type="text"/>	30.	Enter 30
<input type="text"/> Data	3.	Data 3 entry
<input type="text"/> 4 <input type="text"/> 0 <input type="text"/>	40.	Enter 40
<input type="text"/> Data	4.	Data 4 entry
<input type="text"/> SHIFT <input type="text"/> <input type="text"/> [CD]	3.	Delete data
<input type="text"/> SHIFT <input type="text"/> <input type="text"/> $\Sigma x^2$	96.	

## Output of Statistical Calculation Results

Output	Operation	Equation
Number of data sample	$n$ □	--
Mean of x	$\bar{x}$ □	$\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$
Sample standard deviation of x	$s$ □	$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{(n-1)}}$
Population standard deviation of x	$\sigma$ □	$\sigma^n = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}}$
Variance of sample	$s^2$ □ $x^2$	$v^{n-1} = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{(n-1)}$
Variance of population	$\sigma^2$ □ $x^2$	$v^n = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$
Summation of x	$\Sigma x$ □	$\Sigma x$
Sum of Square	$\Sigma x^2$ □	$\Sigma x^2$

## Statistical Calculation Examples

You bought 20 pieces of pizza. However, the diameter of each pizza is varied as shown in the following table. Please calculate the statistic based on this information.

Diameter	Midpoint	Frequency
27.6 ~ 28.5	28	2
28.6 ~ 29.5	29	4
29.6 ~ 30.5	30	5
30.6 ~ 31.5	31	6
31.6 ~ 32.5	32	3
		(20 in total)

Operation	Display	Explanation	
	(STAT) 0.	Statistic mode	
	0.0000	Decimal digit specification	
	2.0000	Give the sum of frequency	
	6.0000		
	11.0000		
	17.0000		
	20.0000		
	20.0000		Total number of data sample
	30.2000		Mean of x
	604.0000	Summation of x	
	18270.0000	Sum of Square of the value	
	1.2397	Sample standard deviation of x	
	1.2083	Population of standard deviation of x	




## 6. Errors

The calculator will overflow in the following instances. Further calculations will not be possible as the calculator will be electronically locked.

- When the calculation result is outside the following range:  
 $x = 0, 1 \times 10^{-99} \leq |x| < 1 \times 10^{100}$   
x: Calculation result
- When the contents of the memory are outside the following range:  
 $x = 0, 1 \times 10^{-99} \leq |x| < 1 \times 10^{100}$   
x: Memory contents  
(The data stored before the overflow error are retained.)
- When numbers are entered outside the following range and a basic function key (+, −, ×, ÷) is pressed.  
 $x = 0, 1 \times 10^{-99} \leq |x| < 1 \times 10^{100}$
- When a  $\div 0$  (division by 0) is performed.
- When data exceeds the range of any function or statistical calculation.
- During statistical calculation;
  - (1) If **S** is calculated with only one data input
  - (2) To find  $\bar{x}$ ,  $\sigma$  and **S** when  $n = 0$
  - (3) When any input is outside the allowable calculation range:  
 $x = 0, 1 \times 10^{-99} \leq |x| < 1 \times 10^{100}$   
x: calculation result
  - (4) When any input is outside the allowable calculation range:  
 $x = 0, 1 \times 10^{-99} \leq |x| < 1 \times 10^{100}$
- When the number of operators stored in the calculator during parentheses and arithmetic calculation exceeds 5 levels.
- When more than 15 open parentheses are used at one time.

The overflow display is: (E 0.)

Press , to clear the error.



## Exponential Calculations

Example	Operation	Display
$(321 \times 10^{-14}) \times$ $(65 \times 10^{28}) =$ $2.0865 \times 10^{18}$	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[3]</span> <span>[2]</span> <span>[1]</span> <span>[EXP]</span> <span>[1]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[4]</span> <span>[(-)]</span> <span>[×]</span> <span>[6]</span> <span>[5]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[EXP]</span> <span>[2]</span> <span>[8]</span> <span>[=]</span></div>	2.0865 <sup>18</sup>

## Fractional Calculations

Example	Operation	Display
$\frac{2}{3} + 3\frac{4}{7} - \frac{5}{4} = 2\frac{83}{84}$	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[2]</span> <span>[a b/c]</span> <span>[3]</span> <span>[+]</span> <span>[3]</span> <span>[a b/c]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[4]</span> <span>[a b/c]</span> <span>[7]</span> <span>[-]</span> <span>[5]</span> <span>[a b/c]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[4]</span> <span>[=]</span></div>	2└83└84.
$(\frac{3}{5} + 2\frac{3}{8}) \times \frac{2}{5} \div 2 - 1$ $= -\frac{81}{200}$	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[ ( ]</span> <span>[3]</span> <span>[a b/c]</span> <span>[5]</span> <span>[+]</span> <span>[2]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[a b/c]</span> <span>[3]</span> <span>[a b/c]</span> <span>[8]</span> <span>[ ) ]</span> <span>[×]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[2]</span> <span>[a b/c]</span> <span>[5]</span> <span>[÷]</span> <span>[2]</span> <span>[-]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[1]</span> <span>[=]</span></div>	-81└200.

## Constant Calculations

Example	Operation	Display
$2 + \underline{3} = 5$	<span>[2]</span> <span>[+]</span> <span>[3]</span> <span>[=]</span>	5.
$4 + \underline{3} = 7$	<span>[4]</span> <span>[+]</span> <span>[3]</span> <span>[=]</span>	7.
$1 - \underline{2} = -1$	<span>[1]</span> <span>[-]</span> <span>[2]</span> <span>[=]</span>	-1.
$2 - \underline{2} = 0$	<span>[2]</span> <span>[-]</span> <span>[2]</span> <span>[=]</span>	0.
$\underline{3} \times 2 = 6$	<span>[3]</span> <span>[×]</span> <span>[2]</span> <span>[=]</span>	6.
$\underline{3} \times 4 = 12$	<span>[3]</span> <span>[×]</span> <span>[4]</span> <span>[=]</span>	12.
$6 \div \underline{3} = 2$	<span>[6]</span> <span>[÷]</span> <span>[3]</span> <span>[=]</span>	2.
$9 \div \underline{3} = 3$	<span>[9]</span> <span>[÷]</span> <span>[3]</span> <span>[=]</span>	3.

## Parentheses Calculations

Example	Operation	Display
$3 + [(4 - 3.6 + 5) \times$ $0.8 - 6] \times 4.2 =$ $-4.056$	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[3]</span> <span>[+]</span> <span>[ ( ]</span> <span>[ ( ]</span> <span>[4]</span> <span>[-]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[3]</span> <span>[.]</span> <span>[6]</span> <span>[+]</span> <span>[5]</span> <span>[ ) ]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[×]</span> <span>[.]</span> <span>[8]</span> <span>[-]</span> <span>[6]</span> <span>[ ) ]</span></div> <div style="display: flex; flex-wrap: wrap; gap: 5px;"> <span>[×]</span> <span>[4]</span> <span>[.]</span> <span>[2]</span> <span>[=]</span></div>	-4.056

## Percentage Calculations

Example	Operation	Display
$200 \times 17\% = 34$	$\boxed{2} \boxed{0} \boxed{0} \times \boxed{1} \boxed{7}$ $\boxed{\text{SHIFT}} \boxed{\%} \boxed{=}$	34.
$\frac{456}{789} \times 100 =$ $57.79467681\%$	$\boxed{4} \boxed{5} \boxed{6} \div \boxed{7} \boxed{8}$ $\boxed{9} \boxed{\text{SHIFT}} \boxed{\%} \boxed{=}$	57.79467681

## Constant Percentage Calculations

Example	Operation	Display
$12\% \times 1200 = 144$	$\boxed{1} \boxed{2} \boxed{\text{SHIFT}} \boxed{\%} \times \boxed{1}$ $\boxed{2} \boxed{0} \boxed{0} \boxed{=}$	144.
$12\% \times 1500 = 180$	$\boxed{1} \boxed{5} \boxed{0} \boxed{0} \boxed{=}$	180.
$\frac{765}{987} \times 100\% =$ $77.50759878\%$	$\boxed{7} \boxed{6} \boxed{5} \div \boxed{9} \boxed{8}$ $\boxed{7} \boxed{\text{SHIFT}} \boxed{\%} \boxed{=}$	77.50759878
$\frac{654}{987} \times 100\% =$ $66.26139818\%$	$\boxed{6} \boxed{5} \boxed{4} \boxed{=}$	66.26139818

## Add-On (Mark Up) Calculation

Example	Operation	Display
$200 + (200 \times 20\%)$ $= 240$	$\boxed{2} \boxed{0} \boxed{0} + \boxed{2} \boxed{0}$ $\boxed{\text{SHIFT}} \boxed{\%} \boxed{=}$	240.

## Discount Calculation

Example	Operation	Display
$200 - (200 \times 20\%)$ $= 160$	$\boxed{2} \boxed{0} \boxed{0} - \boxed{2} \boxed{0}$ $\boxed{\text{SHIFT}} \boxed{\%} \boxed{=}$	160.

## Independent Memory Calculation

Example	Operation	Display
	<b>ON</b> <b>CA</b> <b>X→M</b>	0.
$20 \times 30 = 600$	<b>2</b> <b>0</b> <b>×</b> <b>3</b> <b>0</b> <b>=</b>	
	<b>M+</b>	M 600.
$40 \times 50 = 2000$	<b>4</b> <b>0</b> <b>×</b> <b>5</b> <b>0</b> <b>=</b>	
	<b>M+</b>	M 2000.
$\text{+)} \quad 15 \times 20 = 300$	<b>1</b> <b>5</b> <b>×</b> <b>2</b> <b>0</b> <b>=</b>	
	<b>M+</b>	M 300.
$2900$	<b>MR</b>	M 2900.
$\text{-)} \quad 125 \times 40 = -5000$	<b>1</b> <b>2</b> <b>5</b> <b>×</b> <b>4</b> <b>0</b>	
	<b>=</b> <b>SHIFT</b> <b>M-</b>	M 5000.
$-2100$	<b>MR</b>	M -2100.
	<b>ON</b> <b>CA</b> <b>X→M</b>	0.

## Memory Variable Calculation

Example	Operation	Display
$9 \times 6 + 3 = 57$	<b>9</b> <b>×</b> <b>6</b> <b>+</b> <b>3</b> <b>=</b>	
	<b>SHIFT</b> <b>STO</b> <b>A</b>	57.
$\text{x)} \quad 5 \times 8 = 40$	<b>5</b> <b>×</b> <b>8</b> <b>=</b> <b>SHIFT</b>	
	<b>STO</b> <b>B</b>	40.
	<b>RCL</b> <b>A</b>	57.
	<b>×</b> <b>RCL</b> <b>B</b>	40.
$2,280$	<b>=</b>	2280.

## 2. Binary / Octal / Hexadecimal Calculations

### Binary Calculations

- **Addition and Subtraction (BIN):**  ON  CA  SHIFT  BIN

Example	Operation	Display
10101011 + 1100 + 1110 = 11000101	<input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> + <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 0 <input type="checkbox"/> + <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> =	11000101.
11100011 - 10101100 = 110111	<input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 0 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> - <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 0 <input type="checkbox"/> =	110111.

- **Multiplication and Division (BIN)**

Example	Operation	Display
11 x 1001 = 11011	<input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> × <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> =	11011.
1101110 ÷ 1010 = 1011	<input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> ÷ <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> =	1011.

### Octal Calculations

- **Addition and Subtraction (OCT):**  ON  CA  SHIFT  OCT

Example	Operation	Display
654 + 321 = 1175	<input type="checkbox"/> 6 <input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> + <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> =	1175.
741 - 357 = 362	<input type="checkbox"/> 7 <input type="checkbox"/> 4 <input type="checkbox"/> 1 <input type="checkbox"/> - <input type="checkbox"/> 3 <input type="checkbox"/> 5 <input type="checkbox"/> 7 <input type="checkbox"/> =	362.

## • Multiplication and Division (OCT)

Example	Operation	Display
56 x 23 = 1552	5 6 × 2 3 =	1552.
621 ÷ 12 = 50	6 2 1 ÷ 1 2 =	50.

## • Mixed Calculations (OCT)

Example	Operation	Display
52 + 63 x 14 = 1216	5 2 + 6 3 × 1 4 =	1216.

## Hexadecimal Calculations

### • Addition and Subtraction (HEX): ON CA SHIFT ▶ HEX

Example	Operation	Display
AAA + BB + C = B71	$\overset{A}{\square} \overset{A}{\square} \overset{A}{\square} + \overset{B}{\square} \overset{B}{\square}$ $+ \overset{C}{\square} =$	b71.
DEF - EFE = FFFFFFFEF1	$\overset{D}{\square} \overset{E}{\square} \overset{F}{\square} - \overset{E}{\square} \overset{F}{\square}$ $\overset{E}{\square} =$	FFFFFFFEF1.

## • Multiplication and Division (HEX)

Example	Operation	Display
FEDC x A9 = A83F3C	$\overset{F}{\square} \overset{E}{\square} \overset{D}{\square} \overset{C}{\square} \times \overset{A}{\square}$ 9 =	A83F3C.
CA11 ÷ DF = E7	$\overset{C}{\square} \overset{A}{\square} 1 1 \div \overset{D}{\square}$ $\overset{F}{\square} =$	E7.

## • Mixed Calculations (HEX)

Example	Operation	Display
(AB + 9) x D ÷ F = 9C	$(\overset{A}{\square} \overset{B}{\square} + 9)$ $\times \overset{D}{\square} \div \overset{F}{\square} =$	9C.

### 3. Basic Function Calculations

Pi Function:  $\pi$

Example	Operation	Display
$\pi \times 10$	<input type="text"/> <input type="text"/> $\pi$ <input type="text"/> $\times$ <input type="text"/> 1 <input type="text"/> 0 <input type="text"/> =	31.41592654

Trigonometric Functions:  sin  cos  tan

Example	Operation	Display
$\sin 53 = 0.79863551$	[DEG mode] <input type="text"/> 5 <input type="text"/> 3 <input type="text"/> sin	0.79863551
$\cos \frac{\pi}{6} = 0.866025403$	[RAD mode] <input type="text"/> <input type="text"/> $\pi$ <input type="text"/> $\div$ <input type="text"/> 6 <input type="text"/> = <input type="text"/> cos	0.866025403
$\tan 65^{\text{GRAD}} = 1.631851687$	[GRAD mode] <input type="text"/> 6 <input type="text"/> 5 <input type="text"/> tan	1.631851687

Inverse Trigonometric Functions:   $\sin^{-1}$    $\cos^{-1}$    $\tan^{-1}$

Example	Operation	Display
$\sin^{-1} 0.3 = 17.45760312^{\circ}$	[DEG mode] <input type="text"/> $\cdot$ <input type="text"/> 3 <input type="text"/> <input type="text"/> $\sin^{-1}$	17.45760312
$\cos^{-1} 0.8 = 36.86989765^{\circ}$	[DEG mode] <input type="text"/> $\cdot$ <input type="text"/> 8 <input type="text"/> <input type="text"/> $\cos^{-1}$	36.86989765
$\tan^{-1} 1.5 = 56.30993247^{\circ}$	[DEG mode] <input type="text"/> 1 <input type="text"/> $\cdot$ <input type="text"/> 5 <input type="text"/> <input type="text"/> $\tan^{-1}$	56.30993247

Logarithmic Functions:  log  ln

Example	Operation	Display
$\log 123 = 2.089905111$	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> log	2.089905111
$\ln 123 = 4.812184355$	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> ln	4.812184355



## Logarithmic Mean: $\ln$

Example	Operation	Display
$L = \frac{4-8}{\ln 4 - \ln 8} =$ 5.770780164	( 4 - 8 ) ÷ ( 4 ln - 8 ln ) =	5.770780164

## Exponential Functions: $10^x$ / $e^x$

Example	Operation	Display
$e^{22} = 3584912846$	2 2 $\text{SHIFT}$ $e^x$	3584912846
$10^{2.3} = 199.5262315$	2 . 3 $\text{SHIFT}$ $10^x$	199.5262315

## Square Calculations: $x^2$

Example	Operation	Display
$1.25^2 = 1.5625$	1 . 2 5 $x^2$	1.5625

## Cubic Calculations: $x^3$

Example	Operation	Display
$5.43^3 =$ 160.103007	5 . 4 3 $\text{SHIFT}$ $x^3$ =	160.103007

## Power Calculations: $x^y$

Example	Operation	Display
$2.11^5 =$ 41.82272021	2 . 1 1 $x^y$ 5 =	41.82272021

## Constant Power Calculations: $x^y$

Example	Operation	Display
$2^{2.34} =$ 5.063026376	2 $x^y$ 2 . 3 4 =	5.063026376
$3^{2.34} = 13.07566351$	3 =	13.07566351
$4^{2.34} = 25.63423608$	4 =	25.63423608

## Extraction of Square Root: $\sqrt{\quad}$

Example	Operation	Display
$\sqrt{(5+6) \times 7} =$ 8.774964387	( 5 + 6 ) 7 = $\sqrt{\quad}$	8.774964387

## Multiple Root: $x^{\frac{1}{y}}$

Example	Operation	Display
$5.3\sqrt{100} =$ 2.384286779	1 0 0 $\frac{x^{\frac{1}{y}}}{\square}$ 5 . $\square$ 3 =	2.384286779

## Constant Multiple Root Calculations: $x^{\frac{1}{y}}$

Example	Operation	Display
$\sqrt[5]{1024} = 4$	1 0 2 4 $\frac{x^{\frac{1}{y}}}{\square}$ 5 =	4.
$\sqrt[5]{3125} = 5$	3 1 2 5 =	5.
$\sqrt[5]{7776} = 6$	7 7 7 6 =	6.

## Geometric Mean: $x^{\frac{1}{y}}$

Example	Operation	Display
$\bar{G} = \sqrt[4]{1.23 \times 1.48 \times 1.96 \times 2.2}$ $= 1.673830182$	1 . 2 3 $\times$ 1 . 4 8 $\times$ 1 . 9 6 $\times$ 2 . 2 = $\frac{x^{\frac{1}{y}}}{\square}$ $\frac{x^{\frac{1}{y}}}{\square}$ 4 =	1.673830182

## Extraction of Cubic Root: $\sqrt[3]{\quad}$

Example	Operation	Display
$\sqrt[3]{123} =$ 4.973189833	1 2 3 $\frac{\sqrt[3]{\quad}}{\square}$	4.973189833

## Reciprocal Calculations: $x^{-1}$

Example	Operation	Display
$\frac{1}{2 \times 3 + 4} = 0.1$	$2 \times 3 + 4 =$ [SHIFT] $x^{-1}$	0.1

## Trigonometric Calculations: $x^{-1}$

Example	Operation	Display
cosec $x = 1/\sin x$ cosec $45^\circ =$ 1.414213562	[DEG mode] $4 \ 5 \ \sin$ [SHIFT] $x^{-1}$	1.414213562

## Factorial Calculations: $x!$

Example	Operation	Display
$(4 \times 2 - 3)! = 120$	$4 \times 2 - 3 =$ [SHIFT] $x!$	120.

## Hyperbolic Functions: $\text{hyp}$

Example	Operation	Display
cosh34 = $2.917308713 \times 10^{14}$	$3 \ 4 \ \text{hyp} \ \cos$	$2.917308713^{14}$
tanh1.23 = 0.842579325	$1 \ \square \ 2 \ 3 \ \text{hyp} \ \tan$	0.842579325

## Degree $\rightarrow$ Radian Conversion: $\text{DRG}$

Example	Operation	Display
$60^\circ =$ $1.047197551^{\text{RAD}}$	[DEG mode] $6 \ 0$ [SHIFT] $\text{DRG} \rightarrow$	1.047197551

## Radian $\rightarrow$ Gradient Conversion: $\text{DRG} \rightarrow$

Example	Operation	Display
$2^{\text{RAD}} =$ $127.3239545^{\text{GRAD}}$	[RAD mode] $2$ [SHIFT] $\text{DRG} \rightarrow$	127.3239545

## Gradient → Degree Conversion:

Example	Operation	Display
$120^{\text{GRAD}} = 108$	[GRAD mode] <input type="text" value="1"/> <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="SHIFT"/> <input type="text" value="DRG"/>	108.

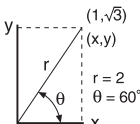
## Permutations (of n things taken r at a time):

Example	Operation	Display
$nP_r = \frac{n!}{(n-r)!}$ $5P_3 = \frac{5!}{(5-3)!} = 60$	<input type="text" value="5"/> <input type="text" value="SHIFT"/> <input type="text" value="nPr"/> <input type="text" value="3"/> <input type="text" value="="/>	60.

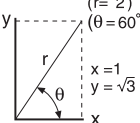
## Combinations (of n things taken r at a time):

Example	Operation	Display
$nC_r = \frac{n!}{r!(n-r)!}$ $5C_3 = \frac{5!}{3!(5-3)!} = 10$	<input type="text" value="5"/> <input type="text" value="SHIFT"/> <input type="text" value="nC_r"/> <input type="text" value="3"/> <input type="text" value="="/>	10.

## Rectangular → Polar Conversion:

Example	Operation	Display
	[DEG mode] <input type="text" value="1"/> <input type="text" value="a"/> <input type="text" value="3"/> <input type="text" value="sqrt"/> <input type="text" value="b"/> <input type="text" value="SHIFT"/> <input type="text" value="R→P"/> <input type="text" value="b"/>	2. 60.

## Polar → Rectangular:

Example	Operation	Display
	[DEG mode] <input type="text" value="2"/> <input type="text" value="a"/> <input type="text" value="6"/> <input type="text" value="0"/> <input type="text" value="b"/> <input type="text" value="SHIFT"/> <input type="text" value="R←P"/> <input type="text" value="b"/>	1. 1.732050808

## Degrees-Minutes-Seconds (DMS) → Decimal Degrees: $\square \square \square$

Example	Operation	Display
123°45'06" →	$\square 1 \square 2 \square 3 \square \square \square \square 4 \square 5 \square \square \square$	123.7516667
123.7516667°	$\square 0 \square 6 \square \square \square = \square \text{SHIFT} \square \leftarrow \square \square \square$	

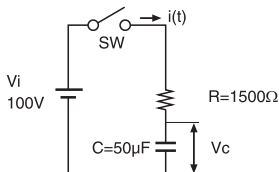
## Decimal Degrees → Degrees-Minutes-Seconds: $\leftarrow \square \square \square$

Example	Operation	Display
2.3456 →	$\square 2 \square \cdot \square 3 \square 4 \square 5 \square 6$	2°20'44"16
2°20'44.16"	$\square = \square \text{SHIFT} \square \leftarrow \square \square \square$	

## 4. Applied Calculations

### Electricity - Integrating Circuit Problem

Obtain the voltage  $V_c$  across the capacitor at  $t=56\text{ms}$  after the switch is turned on.



Example	Operation	Display
$V_c = V_i (1 - e^{-\frac{t}{RC}})$	$\square 1 \square 0 \square 0 \square \times$	52.60562649
$= 100 \times (1 - e^{-\frac{56 \times 10^{-3}}{1500 \times 50 \times 10^{-6}}})$	$\square ( \square 1 \square - \square ($	
$= 52.60562649$	$\square 1 \square 5 \square 0 \square 0$	
	$\square \times \square 5 \square 0 \square \text{EXP}$	
	$\square 6 \square (-) \square \div \square 5$	
	$\square 6 \square \text{EXP} \square 3 \square (-)$	
	$\square ) \square \text{SHIFT} \square x^{-1} \square (-)$	
	$\square \text{SHIFT} \square e^x \square ) \square =$	

## Algebra

The Root of a Quadratic Equation (only for problems having a real root)

Example	Operation	Display
$4x^2 + 9x + 2 = 0$	$4 \quad x^2 \quad - \quad 4 \quad \times$	M      49.
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} =$	$4 \quad \times \quad 2 \quad = \quad \times \rightarrow M$	
$\frac{-9 \pm \sqrt{9^2 - 4 \times 4 \times 2}}{2 \times 4}$	$( \quad 9 \quad (-) \quad + \quad MR$	
$x = \begin{cases} -0.25 \\ -2 \end{cases}$	$\sqrt{\quad} \quad ) \quad \div \quad 2 \quad \div$	M      -0.25
	$4 \quad =$	
	$( \quad 9 \quad (-) \quad - \quad MR$	
	$\sqrt{\quad} \quad ) \quad \div \quad 2 \quad \div$	
	$4 \quad =$	M      -2.

## Calculation of time

**Example 1:** The air flight departs at 2 o'clock 9 minutes and 56 seconds ( $2^{\circ}09'56''$ ), and arrives at 4 o'clock 18 minutes and 23 seconds ( $4^{\circ}18'23''$ ).

What is the travel time

Example	Operation	Display
$4^{\circ}18'23'' -$	$4 \quad \text{ON} \quad 1 \quad 8 \quad \text{ON} \quad 2$	2 <sup>08</sup> '27''
$2^{\circ}09'56'' =$	$3 \quad \text{ON} \quad - \quad 2 \quad \text{ON} \quad 0$	
$2^{\circ}08'27''$	$9 \quad \text{ON} \quad 5 \quad 6 \quad \text{ON} \quad =$	

## Example 2:

The following shows the amount of time worked in three days. What was the total time?

1st day : 5 hours 46 minutes ( $5^{\circ}46'$ )

2nd day : 4 hours 39 minutes ( $4^{\circ}39'$ )

3rd day : 3 hours 55 minutes ( $3^{\circ}55'$ )

Example	Operation	Display
$5^{\circ}46' + 4^{\circ}39' +$	$5 \quad \text{ON} \quad 4 \quad 6 \quad \text{ON} \quad +$	14 <sup>20</sup> '0''
$3^{\circ}55' = 14^{\circ}20'$	$4 \quad \text{ON} \quad 3 \quad 9 \quad \text{ON} \quad +$	
	$3 \quad \text{ON} \quad 5 \quad 5 \quad \text{ON} \quad =$	



## 5. Operation Range and Accuracy

Internal digits: 14

Accuracy\*:  $\pm 1$  at the 10<sup>th</sup> digits

Output Ranges :  $1 \times 10^{-99}$  to  $\pm 9.999999999 \times 10^{99}$

Function		Input
sin x	DEG	$0 \leq  x  < 4.5 \times 10^{10}$
	RAD	$0 \leq  x  \leq 785398163.3$
	GRAD	$0 \leq  x  < 5 \times 10^{10}$
cos x	DEG	$0 \leq  x  < 4.5 \times 10^{10}$
	RAD	$0 \leq  x  \leq 785398163.3$
	GRAD	$0 \leq  x  < 5 \times 10^{10}$
tan x	DEG	Same as sinx except $ x  = 90(2n-1)$
	RAD	Same as sinx except $ x  = \pi/2(2n-1)$
	GRAD	Same as sinx except $ x  = 100(2n-1)$
sin <sup>-1</sup> x cos <sup>-1</sup> x	$0 \leq  x  \leq 1$	
tan <sup>-1</sup> x tanh x	$0 \leq  x  < 1 \times 10^{100}$	
sinh x cosh x	$0 \leq  x  \leq 230.2585092$	When x=0, sinh and tanh, being in some condition, will have more possibility of error, and influence accuracy.
sinh <sup>-1</sup> x	$0 \leq  x  < 5 \times 10^{99}$	
cosh <sup>-1</sup> x	$1 \leq x < 5 \times 10^{99}$	
tanh <sup>-1</sup> x	$0 \leq  x  \leq 9.999999999 \times 10^{-1}$	
ln x	$0 < x < 1 \times 10^{100}$	
log x	$0 < x < 1 \times 10^{100}$	
10 <sup>x</sup>	$-1 \times 10^{100} < x \leq 99.99999999$	
e <sup>x</sup>	$-1 \times 10^{100} < x \leq 230.2585092$	
$\sqrt{x}$	$0 \leq x < 1 \times 10^{100}$	
x <sup>2</sup>	$0 \leq  x  < 1 \times 10^{100}$	
x <sup>-1</sup>	$1 \times 10^{-99} <  x  < 1 \times 10^{100}, x \neq 0$	
$\sqrt[3]{x}$	$0 \leq  x  < 1 \times 10^{100}$	
x!	$0 \leq x \leq 69$ (Integer)	
x <sup>3</sup>	$0 \leq  x  \leq 2.154434689 \times 10^{33}$	

Function	Input
nPr	$0 \leq r \leq n \leq 9999999999$ (r and n are integer) result $< 1 \times 10^{100}$
nCr	$0 \leq r \leq n \leq 9999999999$ (r and n are integer) result $< 1 \times 10^{100}$
$x^y$	$-1 \times 10^{100} < y \cdot \ln x  \leq 230.2585092$ x>0...The above range x<0...y (integer) or, 1/y (odd, y≠0) ... The above range x=0...0<y
$x^{1/y}$	$-1 \times 10^{100} < 1/y \cdot \ln x  \leq 230.2585092$ x>0...The above range x<0...y (odd) or, 1/y (integer, y≠0) ... The above range x=0...0<y
$R \rightarrow P$	$ x ,  y  < 1 \times 10^{100}$ $(x^2 + y^2)^{1/2} < 1 \times 10^{100}$ y/x same as $\tan^{-1}x$
$P \rightarrow R$	$0 \leq r < 1 \times 10^{100}$ $\theta$ : same as $\sin x, \cos x$
<b>o///</b>	$0 \leq  x  \leq 999999.9999$ When input > 999999.9999 the result can not converted to DMS by  
<b>◀o///</b>	$0 \leq  x  \leq 999999^{\circ}59'$
DEG→RAD	$0 \leq  x  < 1 \times 10^{100}$
RAD→GRAD	$0 \leq  x  \leq 1.570796326 \times 10^{98}$
GRAD→DEG	$0 \leq  x  < 1 \times 10^{100}$



Function		Input
Complex number calculation	$(x1+y1 i) \pm (x2+y2 i)$	
	Addition Subtraction	$ x1+x2  < 1 \times 10^{100}$ $ y1+y2  < 1 \times 10^{100}$
	Multiplication	$(x1x2-y1y2) < 1 \times 10^{100}$ $(x1y2+y1x2) < 1 \times 10^{100}$ $(x1x2), (y1y2), (x1y2), (y1x2) < 1 \times 10^{100}$
	Division	$\frac{x1x2+y1y2}{x2^2+y2^2}, \frac{y1x2-x1y2}{x2^2+y2^2} < 1 \times 10^{100}$ $x2^2+y2^2, x2^2, y2^2, x1x2+y1y2, y1x2-x1y2, x1x2, y1y2, y1x2, x1y2 < 1 \times 10^{100}$
→ DEC	The following operation range after the conversion. $0 \leq  x  \leq 9999999999$	
→ BIN	The following operation range after the conversion. $1000000000 \leq x \leq 1111111111$ $0 \leq x \leq 1111111111$	
→ OCT	The following operation range after the conversion. $4000000000 \leq x \leq 7777777777$ $0 \leq x \leq 3777777777$	
→ HEX	The following operation range after the conversion. $FDABF41C01 \leq x \leq FFFFFFFF$ $0 \leq x \leq 2540BE3FF$	
Normal Distributions-statistic Calculation	DATA INPUT	$ x  < 1 \times 10^{100}$ $ \Sigma x  < 1 \times 10^{100}$ $\Sigma x^2 < 1 \times 10^{100}$ $n = \text{Integer}$ $ n  < 1 \times 10^{100}$
	$\bar{x}$	$n \neq 0$
	s	$n \neq 1, n \neq 0$ $0 \leq \frac{\Sigma x^2 - \{(\Sigma x)^2/n\}}{n-1} < 1 \times 10^{100}$
	$x\sigma^n$	$n \neq 0$ $0 \leq \frac{\Sigma x^2 - \{(\Sigma x)^2/n\}}{n} < 1 \times 10^{100}$

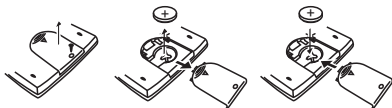
\* In the case of consecutive calculations, errors are cumulative. This is also true when internal consecutive calculations are performed; for example,  $(x^y)$ ,  $x^{1/y}$ ,  $x!$ ,  $nPr$ ,  $nCr$ , etc. In this case, the cumulative data may become large.

# BATTERY REPLACEMENT

When the display characters are dim, turn it off, and replace the alkaline battery immediately.

Please replace the alkaline battery using the following procedure:

1. Press **OFF** to power off the calculator.
2. Remove the screw that secures the battery cover in place.
3. Slide the battery cover slightly and lift it.
4. Remove the old battery with a ball point pen or similar sharp object.
5. Load the new battery with positive "+" side facing up.
6. Replace the battery cover, tighten the screw, and press **ON/CA**, **SHIFT** + **•RESET** to initialize the calculator.



Battery Replacement



**CAUTION:** There is risk of explosion if the battery is replaced by an incorrect type. Dispose of used battery according to the below instructions.





Electromagnetic interference or electrostatic discharge may cause the display to malfunction or the contents of the memory to be lost or altered. Should this occur, press **ON/CA** to restart the calculator.

## ADVICE AND PRECAUTIONS

- This calculator contains precision components such as LSI chips and should not be used in a place subject to rapid variations in temperature, excessive humidity dirt or dust, or exposed to direct sunlight.
- The liquid crystal display panel is made of glass and should not be subjected to excessive pressure.
- When cleaning the device do not use a damp cloth or volatile liquid such as paint thinner. Instead, use only a soft, dry cloth.
- Do not under any circumstances, disassemble this device. If you believe that the calculator is not functioning properly, either bring or mail the device together with proof of purchase to a Canon Business office service representative.
- Never dispose the calculator improperly such as burning; it can create risks of personal injury or harm. You are suggested to dispose this product according to your national law.
- Replace the battery once every two years even it is not used frequently.

### Battery Caution!

- Keep the Battery out of reach of children. If the battery is swallowed, contact a doctor immediately.
- Misuse of battery may cause leakage, explosion, damages or personal injury.
- Don't recharge or disassemble the battery, it could cause a short circuit.
- Never expose the battery to high temperatures, direct heat, or dispose by incineration.
- Never leave a dead battery in the calculator as the dead battery may leak and cause damage to the calculator.
- Continue using the calculator in the low battery condition may cause improper calculations or the stored memory may get corrupted or lost completely. Keep written records of important data all the time; and replace the battery as soon as possible.

■ When you are not sure of the current calculations and setting mode, you are recommended to initialize the calculator to default value by pressing  +  .

## SPECIFICATIONS

- Power Supply : Alkaline battery (LR54 x 1)  
Power Consumption : DC1.5V / 0.038mW  
Battery Life : Approximately 2.5 years  
(Based on 1 hour operation per day)  
Auto power off : Approx. 7 minutes  
Usable Temperature : 0° ~ 40° C (32° F ~ 104° F)  
Size: 122 (L) x 73 (W) x 12 (H) mm (with cover)  
4-51/64" x 2-7/8" x 15/32" (with cover)  
Weight : 70 g (2.4 oz) with cover  
\* Specifications are subject to change without notice

### **For CA, USA Only**

Included battery contains perchlorate material - special handling may apply.

See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/> for detail.