

# fx-82SOLAR fx-260SOLAR

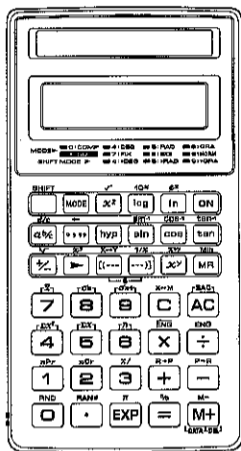
## User's Guide

<http://world.casio.com/edu/>

**CASIO**

RCA503430-001V01

SA0611-A Printed in China



### Handling Precautions

- Be sure to press the **ON** key before using the calculator.
- Your calculator is made up of precision components. Never try to take it apart.
- Avoid dropping your calculator and otherwise subjecting it to strong impact.
- Do not store the calculator or leave it in areas exposed to high temperature or humidity, or large amounts of dust. When exposed to low temperatures, the calculator may require more time to display results and may even fail to operate. Correct operation will resume once the calculator is brought back to normal temperature.
- The display will go blank and keys will not operate during calculations. When you are operating the keyboard, be sure to watch the display to make sure that all your key operations are being performed correctly.
- Avoid using volatile liquids such as thinner or benzene to clean the unit. Wipe it with a soft cloth, or with a cloth that has been dipped in a solution of water and a neutral detergent and wring out.
- In no event will the manufacturer and its suppliers be liable to you or any other person for any damages, expenses, lost profits, lost savings, or any other damages arising out of malfunction, repairs, or insufficient light. The user should prepare physical records of data to protect against such data loss.
- Never dispose of the liquid crystal panel, or other components by burning them.
- Before assuming malfunction of the unit, be sure to carefully reread this manual and ensure that the problem is not due to operational error.
- The contents of this manual are subject to change without notice.
- No part of this manual may be reproduced in any form without the express written consent of the manufacturer.
- Be sure to keep all user documentation handy for future reference.

### Modes

Application	Key Operation	Mode Name*
Standard deviation calculations	<b>MODE</b> <b>1</b>	SD
Normal calculations	<b>MODE</b> <b>0</b>	COMP
Calculations using degrees	<b>MODE</b> <b>4</b>	DEG
Calculations using radians	<b>MODE</b> <b>5</b>	RAD
Calculations using grads	<b>MODE</b> <b>6</b>	GRA
Number of decimal place specification	<b>MODE</b> <b>7</b>	FIX
Number of significant digit specification	<b>MODE</b> <b>8</b>	SCI
Cancels FIX and SCI settings	<b>MODE</b> <b>9</b>	NORM

E

### Basic Calculations

- Use the COMP mode for basic calculations.

- Example 1:  $23 + 4.5 - 53 =$

$23 + 4.5 - 53 = -25.5$

- Example 2:  $56 \times 12 \div 2.5 =$

$56 \times 12 \div 2.5 = 268.8$

- Example 3:  $2 \div 3 \times (1 \times 10^{20}) =$

$2 \div 3 \times 1 \text{EXP} 20 = 6.66666667^{19}$

- Example 4:  $7 \times 8 - 4 \times 5 = 36$

$7 \times 8 - 4 \times 5 = 36$

- Example 5:  $\frac{6}{4 \times 5} = 0.3$

$4 \times 5 \div 6 \text{COMP} \text{XY} = 0.3$

- Example 6:  $2 \times [7 + 6 \times (5 + 4)] = 122$

$2 \times [7 + 6 \times (5 + 4)] = 122$

- You can skip all **COMP** operations before the **=** key.

- Example 7:  $\frac{4}{3} \pi \times 5^3 =$

$\frac{4}{3} \times \pi \times 5^3 = 523.5987756$

### Constant Calculations

- Press **+**, **=**, **x**, or **÷** twice after inputting a number to make that number a constant.
- "K" is on the display while a constant is being used.
- Use the COMP mode for constant calculations.

- Example 1:  $2.3 + 3$ , then  $2.3 + 6$

$2.3 + 3 = K 5.3$   
 $2.3 + 6 = K 8.3$

- Example 2:  $12 \times 2.3$ , then  $12 \times (-9)$

$12 \times 2.3 = K 27.6$   
 $12 \times (-9) = K -108$

- Example 3:  $17 + 17 + 17 + 17 = 68$

$17 + 17 = K 34$   
 $17 + 17 + 17 = K 51$   
 $17 + 17 + 17 + 17 = K 68$

- Example 4:  $1.7^4 = 8.3521$

$1.7^4 = K 2.89$   
 $1.7^8 = K 4.913$   
 $1.7^{16} = K 8.3521$

### Memory Calculations

- Use the COMP mode for memory calculations.
- Use **SHIFT** **(Min)**, **(M+)**, **(M-)** and **(MR)** for memory calculations. **(SHIFT) (Min)** replaces current memory contents.
- "M" appears when there is a value in memory.
- To clear memory, press **0** **(SHIFT) (Min)** or **AC** **(SHIFT) (Min)**.

- Example 1:  $(53 + 6) + (23 - 8) + (56 \times 2) + (99 \div 4) = 210.75$

$(53 + 6) = M 59$   
 $(23 - 8) = M 15$   
 $(56 \times 2) = M 112$   
 $(99 \div 4) = M 24.75$   
**(Memory recall)**  $(MR) = M 210.75$

- Example 2: To calculate the following using memory as shown.

$7 + 7 - 7 + (2 \times 3) + (2 \times 3) - (2 \times 3) = 13$   
 $7 \text{ (SHIFT) (Min)} \text{ (M+)} \text{ (SHIFT) (M-)} 2 \times 3 \text{ (M+)} \text{ (M+)} \text{ (SHIFT) (M-)} \text{ (MR)} = M 13$

- Example 3: To calculate the following using memory and a constant:  $(12 \times 3) - (45 \times 3) + (78 \times 3) = 135$ .

$(12 \times 3) = MK 36$   
 $(45 \times 3) = MK 135$   
 $(78 \times 3) = MK 234$   
**(Memory recall)**  $(MR) = MK 135$

### Fraction Calculations

- Use COMP mode for fraction calculations.
- Total number of digits (including division marks) cannot exceed 10.

- Example 1:  $\frac{2}{3} + \frac{4}{5} = 1\frac{7}{15}$

• Example 5:  $\frac{1}{2} \leftrightarrow 0.5$  (Fraction  $\leftrightarrow$  Decimal)

1  $\frac{1}{2}$  = 1.2  
 0.5 = 0.5  
 1.2 = 1.2

• Example 6:  $1\frac{2}{3} \leftrightarrow \frac{5}{3}$

1  $\frac{2}{3}$  = 1.2  
 1.2 = 1.2  
 5/3 = 1.666666667  
 1.666666667 = 1.666666667

### Percentage Calculations

• Use COMP mode for percentage calculations.

• Example 1: To calculate 12% of 1500.

1500  $\times$  12 % = 180.

• Example 2: To calculate what percentage of 880 is 660.

660  $\div$  880 % = 75.

• Example 3: To add 15% onto 2500.

2500  $\times$  15 % + = 2875.

• Example 4: To discount 3500 by 25%.

3500  $\times$  25 % - = 2625.

• Example 5: To calculate the following using a constant.

12% of 1200 = 144  
 18% of 1200 = 216  
 23% of 1200 = 276

(12%) 1200  $\times$  12 % = 144.  
 (18%) 1200  $\times$  18 % = 216.  
 (23%) 1200  $\times$  23 % = 276.

### Scientific Function Calculations

• Use COMP mode for scientific function calculations.  
 • Some calculations may take a long time to complete.  
 • Wait for result before starting next calculation.  
 •  $\pi = 3.1415926536$ .

#### Sexagesimal Functions

• Example 1:  $14^\circ 25' 36'' + 12^\circ 23' 34'' = 26^\circ 49' 10''$

14  $\circ$  25  $'$  36  $''$  +  
 12  $\circ$  23  $'$  34  $''$  = 26  $\circ$  49  $'$  10  $''$ .

• Example 2:  $1^\circ 2' 3'' + 4.56 = 5.594166667$

1  $\circ$  2  $'$  3  $''$  + 4.56 = 5.594166667

• Example 3:  $\sin 87^\circ 65' 43.21'' = 0.999447513$  (DEG mode)

87  $\circ$  65  $'$  43.21  $''$  sin = 0.999447513

• Example 4:  $1.23 \leftrightarrow 1^\circ 13' 48''$

1.23 = 1  $\circ$  13  $'$  48  $''$   
 1  $\circ$  13  $'$  48  $''$  = 1.23

• Example 5:  $12^\circ 34' \leftrightarrow 12.56666667$

12  $\circ$  34  $'$  = 12.56666667

You can also use  $\leftrightarrow$  when inputting values to convert between sexagesimal and decimal.

#### Trigonometric/Inverse Trigonometric Functions

• Example 1:  $\sin(\frac{\pi}{6} \text{ rad})$  (RAD mode)

sin  $\frac{\pi}{6}$  = 0.5

• Example 2:  $\cos 63^\circ 52' 41''$  (DEG mode)

cos 63  $\circ$  52  $'$  41  $''$  = 0.440283084

• Example 3:  $\tan(-35\text{gra})$  (GRA mode)

tan -35 gra = -0.612800788

• Example 4:  $\cos^{-1}(\frac{\sqrt{2}}{2})$  (RAD mode)

cos<sup>-1</sup>  $\frac{\sqrt{2}}{2}$  = 0.785398163

• Example 5: To convert 45 degrees to radians, grads, and back to degrees

45 DEG = 45  
 45 DEG = 0.785398163 RAD  
 0.785398163 RAD = 50 GRA  
 50 GRA = 45 DEG

Repeated conversion between angle units can cause normally minute error to accumulate, resulting in poor precision.

#### Hyperbolic/Inverse Hyperbolic Functions

• Example 1:  $\sinh 3.6$

sinh 3.6 = 18.28545536

• Example 2:  $\sinh^{-1} 30$

sinh<sup>-1</sup> 30 = 4.094622224

#### Common and Natural Logarithms, Exponents

• Example 1:  $\log 1.23$

log 1.23 = 0.089905111

• Example 2:  $\ln 90 (= \log_e 90)$

ln 90 = 4.49980967

• Example 3:  $\frac{\log 64}{\log 4}$

$\frac{\log 64}{\log 4}$  = 3.

• Example 4:  $10^{0.4} + 5e^{-8}$

$10^{0.4} + 5e^{-8}$  = 2.760821773

• Example 5:  $2^3$

$2^3$  = 8.

• Example 6:  $2^{-3}$

$2^{-3}$  = 0.125

• Example 7:  $e^{10}$

$e^{10}$  = 22026.46579

• Example 8:  $\log \sin 40^\circ + \log \cos 35^\circ$  (DEG mode)

$\log \sin 40^\circ + \log \cos 35^\circ$  = -0.278567983

To convert to antilogarithm:

$10^{-0.278567983}$  = 0.526540784

• Example 9:  $8^{1/3}$

$8^{1/3}$  = 2.

### Square Roots, Cube Roots, Squares, Reciprocals and Factorials

• Example 1:  $\sqrt{2} + \sqrt{3} \times \sqrt{5}$

$\sqrt{2} + \sqrt{3} \times \sqrt{5}$  = 5.287196909

• Example 2:  $\sqrt[3]{5} + \sqrt{-27}$

$\sqrt[3]{5} + \sqrt{-27}$  = -1.290024053

• Example 3:  $(-30)^2$

$(-30)^2$  = 900.

• Example 4:  $\frac{1}{\frac{1}{3} - \frac{1}{4}}$

$\frac{1}{\frac{1}{3} - \frac{1}{4}}$  = 12.

• Example 5:  $8!$

$8!$  = 40320.

### FIX, SCI, NORM, RND, RAN#, ENG Calculations

• Example 1:  $1.234 + 1.234$ , rounding result to two places (FIX 2).

1.234 + 1.234 = 2.47

• Example 2:  $1.234 + 1.234$ , rounding input to two places.

1.234 + 1.234 = 2.46

• Press  $\text{MODE}$   $\rightarrow$  9 to clear FIX specification.

• Example 3:  $1 + 3$ , displaying result with two significant digits (SCI 2).

1 + 3 = 3.3<sup>-01</sup>

• Press  $\text{MODE}$   $\rightarrow$  8 to clear SCI specification.

• Example 4: To convert 56,088 meters to kilometers.

56088 ENG = 56.088<sup>-03</sup>

• Example 5: To convert 0.08125 grams to milligrams.

0.08125 ENG = 81.25<sup>-03</sup>

• Example 6: To generate a random number between 0.000 and 0.999.

RAN# = 0.664

### Coordinate Conversion

• Example 1: To convert polar coordinates ( $r=2, \theta=60^\circ$ ) to rectangular coordinates ( $x, y$ ). (DEG mode)

$x = 2 \cos 60^\circ = 1$   
 $y = 2 \sin 60^\circ = 1.732050808$

$\text{SHIFT}$   $\text{X} \leftrightarrow \text{Y}$  swaps displayed value with value in memory.

• Example 2: To convert rectangular coordinates ( $1, \sqrt{3}$ ) to polar coordinates ( $r, \theta$ ). (RAD mode)

$r = \sqrt{1^2 + (\sqrt{3})^2} = 2$   
 $\theta = \tan^{-1}(\frac{\sqrt{3}}{1}) = 1.047197551$

### Permutation

• Example: To determine how many different 4-digit values can be produced using the numbers 1 through 7.

$7 \text{P} 4 = 840$

### Combination

• Example: To determine how many different 4-member groups can be organized in a group of 10 individuals.

$10 \text{C} 4 = 210$

## Statistical Calculations (SD Mode)

- Press **MODE** to enter the SD Mode for statistical calculations using standard deviation.
- If FIX or SCI is on the display, press **MODE** **9** first.
- Data input always starts with **SHIFT** **SAC**.

**Example:** To calculate  $\sigma_{n-1}$ ,  $\sigma_n$ ,  $\bar{x}$ ,  $n$ ,  $\Sigma x$ , and  $\Sigma x^2$  for the following data: 55, 54, 51, 55, 53, 53, 54, 52

Enter SD Mode.	<b>MODE</b> <b>9</b>	SD 0.
Input Data.	<b>SHIFT</b> <b>SAC</b> 55 <b>DATA</b> 54 <b>DATA</b> 51 <b>DATA</b> 55 <b>DATA</b> 53 <b>DATA</b> 53 <b>DATA</b> 54 <b>DATA</b> 52 <b>DATA</b>	SD 52.
Sample standard deviation	<b>SHIFT</b> <b>σ<sub>n-1</sub></b>	SD 1.407885953
Population standard deviation	<b>SHIFT</b> <b>σ<sub>n</sub></b>	SD 1.316956719
Arithmetic mean	<b>SHIFT</b> <b>Σ<sup>-</sup></b>	SD 53.375
Number of data	<b>SHIFT</b> <b>n</b>	SD 8.
Sum of values	<b>SHIFT</b> <b>Σ<sup>+</sup></b>	SD 427.
Sum of squares of values	<b>SHIFT</b> <b>Σ<sup>2</sup></b>	SD 22805.

- DATA** **DATA** inputs the same data twice (as above).
- You can also input multiple entries of the same data using **×**. To input the data 110 ten times, for example, press 110 **×** 10 **DATA**.
- The above results can be obtained in any order, and not necessarily that shown above.
- To delete data you have just input, press **SHIFT** **DEL**.

### ■ Making Corrections During Data Input

**Example 1:** To change data you have just input.

Correct	Actual	Correction
51 <b>DATA</b>	50 <b>DATA</b>	<b>SHIFT</b> <b>DEL</b> 51 <b>DATA</b>
130 <b>×</b> 31 <b>DATA</b>	120 <b>×</b> 31 <b>DATA</b>	<b>AC</b> 130 <b>×</b> 31 <b>DATA</b>
130 <b>×</b> 31 <b>DATA</b>	120 <b>×</b> 31 <b>DATA</b>	<b>AC</b> 130 <b>×</b> 31 <b>DATA</b>

**Example 2:** To change data you previously input.

Correct	Actual	Correction
51 <b>DATA</b>	49 <b>DATA</b>	49 <b>SHIFT</b> <b>DEL</b> 51 <b>DATA</b>
130 <b>×</b> 31 <b>DATA</b>	120 <b>×</b> 30 <b>DATA</b>	120 <b>×</b> 30 <b>SHIFT</b> <b>DEL</b> 130 <b>×</b> 31 <b>DATA</b>

## Technical Information

### ■ Keys and Their Functions

#### • General

All clear	<b>AC</b>
Arithmetic calculations	<b>+</b> , <b>-</b> , <b>×</b> , <b>÷</b> , <b>=</b>
Backspace	<b>→</b>
Clear (retains memory)	<b>C</b>
Number input	<b>0</b> - <b>9</b> , <b>.</b>
Power on; All reset	<b>ON</b>
Sign change	<b>±</b>

#### • Memory

Memory in	<b>SHIFT</b> <b>MIn</b>
Memory minus	<b>SHIFT</b> <b>M-</b>
Memory plus	<b>M+</b>
Memory recall	<b>M/R</b>

#### • Special

Display/memory swap	<b>SHIFT</b> <b>X-Y</b> , <b>SHIFT</b> <b>X-M</b>
Exponent	<b>EXP</b>
Internal rounding	<b>SHIFT</b> <b>RND</b>
Parentheses	<b>(</b> , <b>)</b>
Pi (3.1415926536)	<b>SHIFT</b> <b>π</b>
Select mode	<b>MODE</b>
Sexagesimal	<b>←</b> , <b>SHIFT</b> <b>↕</b>
Shifts key functions	<b>SHIFT</b>

#### • Scientific Functions

Arc cosine	<b>SHIFT</b> <b>cos<sup>-1</sup></b>
Arc sine	<b>SHIFT</b> <b>sin<sup>-1</sup></b>
Arc tangent	<b>SHIFT</b> <b>tan<sup>-1</sup></b>
Common antilogarithm	<b>SHIFT</b> <b>10<sup>x</sup></b>
Common logarithm	<b>log</b>
Convert to degrees	<b>SHIFT</b> <b>MODE</b> <b>4</b>
Convert to grads	<b>SHIFT</b> <b>MODE</b> <b>6</b>
Convert to radians	<b>SHIFT</b> <b>MODE</b> <b>5</b>
Cosine	<b>cos</b>
Cube	<b>SHIFT</b> <b>x<sup>3</sup></b>
Cube root	<b>SHIFT</b> <b>√<sup>3</sup></b>
Engineering	<b>SHIFT</b> <b>ENG</b> , <b>SHIFT</b> <b>ENG</b>
Factorial	<b>SHIFT</b> <b>x!</b>
Fraction	<b>α/β</b>
Fraction	<b>SHIFT</b> <b>d/c</b>
Hyperbolic	<b>hyp</b>
Natural antilogarithm	<b>SHIFT</b> <b>e<sup>x</sup></b>
Natural logarithm	<b>ln</b>
Percent	<b>SHIFT</b> <b>%</b>
Polar-to-rectangular	<b>SHIFT</b> <b>P-R</b>
Power	<b>x<sup>y</sup></b>
Random number	<b>SHIFT</b> <b>RAND</b>
Reciprocal	<b>SHIFT</b> <b>1/x</b>
Rectangular-to-polar	<b>SHIFT</b> <b>R-P</b>
Root	<b>SHIFT</b> <b>x<sup>1/y</sup></b>

Sine	<b>sin</b>
Square	<b>x<sup>2</sup></b>
Square root	<b>SHIFT</b> <b>√</b>
Tangent	<b>tan</b>
Permutation	<b>SHIFT</b> <b>nPr</b>
Combination	<b>SHIFT</b> <b>nCr</b>

### • Statistics (SD Mode)

Arithmetic mean	<b>SHIFT</b> <b>Σ<sup>-</sup></b>
Data delete	<b>SHIFT</b> <b>DEL</b>
Data input	<b>DATA</b>
Number of data	<b>SHIFT</b> <b>n</b>
Population standard deviation	<b>SHIFT</b> <b>σ<sub>n</sub></b>
Sample standard deviation	<b>SHIFT</b> <b>σ<sub>n-1</sub></b>
Statistical register clear	<b>SHIFT</b> <b>SAC</b>
Sum of squares of values	<b>SHIFT</b> <b>Σ<sup>2</sup></b>
Sum of values	<b>SHIFT</b> <b>Σ<sup>+</sup></b>

### ■ Exponential Display Formats

This calculator can display up to 10 digits. Larger values are automatically displayed using exponential notation. In the case of decimal value, you can select between two formats that determine at what point exponential notation is used.

#### • NORM 1

With NORM 1, exponential notation is automatically used for integer values with more than 10 digits and decimal values with more than two decimal places.

#### • NORM 2

With NORM 2, exponential notation is automatically used for integer values with more than 10 digits and decimal values with more than nine decimal places.

#### To switch between NORM 1 and NORM 2

Press **MODE** **9**. There is no indication on the display of which format is currently in effect, but you can determine the setting by performing the following calculation.

1 <b>+</b> 200 <b>=</b>	5. <sup>-03</sup>	NORM 1 format
	0.005	NORM 2 format

- All of the examples in this manual show calculation results using the NORM 1 format.

### ■ When you have a problem.....

If calculation results are not what you expect or if an error occurs, perform the following steps.

- MODE** **0** (COMP mode)
- MODE** **4** (DEG mode)
- MODE** **9** (NORM mode)
- Check the formula you are working with to confirm it is correct.
- Enter the correct modes to perform the calculation and try again.

### ■ Making Corrections During Calculations

- If you make a mistake when inputting a value (but did not yet press an operator key), use **→** to backspace and delete input digits one-by-one. Or you can press **C** to clear the input entirely and start again.
- In a series of calculations, press **C** while an intermediate result is displayed to clear only the last calculation performed.
- To change the operator key (**+**, **-**, **×**, **÷**, **x<sup>2</sup>**, **SHIFT** **x<sup>3</sup>**, etc.) you just pressed, simply press the correct operator key. In this case, the operator of the last key you press is used, but the operation retains the order of precedence of the operation for the first key you pressed.

### ■ Overflow or Error Check

The following conditions make further calculation impossible.

- When a result (whether intermediate or final) or a total accumulated in memory is greater than  $\pm 9.99999999 \times 10^{99}$ . ("E-" indicator appears on the display.)
- When function calculations are performed using a value that exceeds the input range. ("E-" indicator appears on the display.)
- When an illogical operation (such as an attempt to calculate  $\bar{x}$  and  $\sigma_n$  while  $n = 0$ ) is performed during statistical calculations. ("E-" indicator appears on the display.)
- When an illegal mathematical operation (such as division by zero) is performed. ("E-" indicator appears on display.)
- The total number of nested parentheses levels exceeds six, or when more than 18 pairs of parentheses are used. ("E-" indicator appears on the display.)

- To clear any of the above conditions, press **AC** and perform the calculation from the beginning.
- In the case of condition e, you could also press **C**. This clears the intermediate result just prior to the overflow, so you can continue with the calculation from that point.
- No error occurs when the result is within the range of  $\pm(1 \times 10^{-99})$  to  $-(1 \times 10^{-99})$ . Instead, the display shows all zeros.

### ■ Power Supply

This calculator is powered by a solar cell that converts available light into electrical power.

#### Solar Cell Precautions

- The solar cell requires at least 50 lux of light to provide power.
- If available light is too low, the display may become dim, calculation functions may become impossible, or the contents of the independent memory may be lost. If this happens, move to an area with more light.

### ■ Order of Operations and Levels

Operations are performed in the following order of precedence.

- Functions
- $x^y$ ,  $x^{1/y}$ ,  $R \rightarrow P$ ,  $P \rightarrow R$ ,  $nPr$ ,  $nCr$
- $\times$ ,  $\div$
- $+$ ,  $-$
- Operations with the same precedence are performed from left to right, with operations enclosed in parentheses performed first. If parentheses are nested, the operations enclosed in the innermost set of parentheses are performed first.
- Registers L<sub>1</sub> through L<sub>6</sub> store operations. There are six registers, so calculations up to six levels can be stored.
- Each level can contain up to three open parentheses, so parentheses can be nested up to 18 times.

- **Example:** The following operation uses 4 levels and 5 nested parentheses.

2 × ((3 + 4) × 5) + 4

The table below shows register contents following the above input.

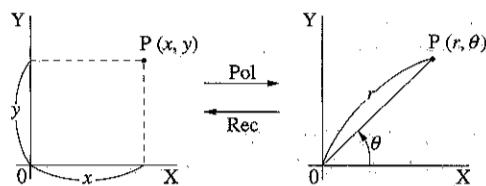
Register	Contents
X	4
L <sub>1</sub>	(( (5 +
L <sub>2</sub>	4 ×
L <sub>3</sub>	(( (3 +
L <sub>4</sub>	2 ×
L <sub>5</sub>	
L <sub>6</sub>	

### Formulas and Ranges

The following are the formulas and ranges that are applied to various calculations that can be performed using this calculator.

#### Coordinate Transformation

- With polar coordinates,  $\theta$  can be calculated within a range of  $-180^\circ < \theta \leq 180^\circ$ . The calculation range is the same for radians and grads.



#### Permutation

- Input range:  $n \geq r \geq 0$  ( $n, r$ : integers)

$$\text{Formula: } nPr = \frac{n!}{(n-r)!}$$

#### Combination

- Input range:  $n \geq r \geq 0$  ( $n, r$ : integers)

$$\text{Formula: } nCr = \frac{n!}{r!(n-r)!}$$

#### Population Standard Deviation

$$\sigma_n = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}} = \sqrt{\frac{\sum x_i^2 - (\sum x_i)^2 / n}{n}}$$

#### Sample Standard Deviation

$$\sigma_{n-1} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum x_i^2 - (\sum x_i)^2 / n}{n-1}}$$

#### Arithmetic Mean

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{\sum x}{n}$$

#### Input Ranges

Functions	Input Range
sin x cos x tan x	(DEG) $ x  < 9 \times 10^9$ (RAD) $ x  < 5 \times 10^7 \pi$ rad (GRA) $ x  < 1 \times 10^{10}$ grad However, for tan x: $ x  \neq 90(2n+1)$ : DEG $ x  \neq \pi/2(2n+1)$ : RAD $ x  \neq 100(2n+1)$ : GRA
$\sin^{-1}x$ $\cos^{-1}x$	$ x  \leq 1$
$\tan^{-1}x$	$ x  < 1 \times 10^{100}$
sinh x cosh x	$ x  \leq 230.2585092$
tanh x	$ x  < 1 \times 10^{100}$
$\sinh^{-1}x$	$ x  < 5 \times 10^{99}$
$\cosh^{-1}x$	$1 \leq x < 5 \times 10^{99}$
$\tanh^{-1}x$	$ x  < 1$
log x / ln x	$1 \times 10^{-99} \leq x < 1 \times 10^{100}$
$10^x$	$-1 \times 10^{100} < x < 100$
$e^x$	$-1 \times 10^{100} < x \leq 230.2585092$
$\sqrt{x}$	$0 \leq x < 1 \times 10^{100}$
$x^2$	$ x  < 1 \times 10^{50}$
$x^3$	$ x  < 2.154434690 \times 10^{33}$
1/x	$ x  < 1 \times 10^{100}; x \neq 0$
$\sqrt[n]{x}$	$ x  < 1 \times 10^{100}$
x!	$0 \leq x \leq 69$ (x is an integer)
nPr/nCr	$0 \leq r \leq n$ $n < 1 \times 10^{10}$ (n and r are integers)
R→P	$\sqrt{x^2 + y^2} < 1 \times 10^{100}$
P→R	$0 \leq r < 1 \times 10^{100}$ (DEG) $ \theta  < 9 \times 10^9$ (RAD) $ \theta  < 5 \times 10^7 \pi$ rad (GRA) $ \theta  < 1 \times 10^{10}$ grad
" "	Input and Results: Total of hour, minutes, and seconds digits must be 10 or fewer (including separator symbols) Decimal ↔ Sexagesimal Conversions $ x  \leq 2777777.777$
$x^y$	$x > 0; -1 \times 10^{100} < y \log x < 100$ $x = 0; y > 0$ $x < 0; y = n; \frac{1}{2n+1}$ (n is an integer) However: $-1 \times 10^{100} < y \log  x  < 100$
$x^{1/y}$	$x > 0; y \neq 0$ $-1 \times 10^{100} < 1/y \log x < 100$ $x = 0; y > 0$ $x < 0; y = 2n+1; \frac{1}{m}$ (m ≠ 0; m and n are integers) However: $-1 \times 10^{100} < 1/y \log  x  < 100$
a b/c	Total of integer, numerator, and denominator must be 10 digits or less (including division marks).
SD	$ x  < 1 \times 10^{50}$ $ n  < 1 \times 10^{100}$ $\sigma_n, \bar{x}; n \neq 0$ $\sigma_{n-1}; n \neq 0, 1$

- For a single calculation, calculation error is  $\pm 1$  at the 10th digit. (In the case of exponential display, calculation error is  $\pm 1$  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 in the case of  $x^y, x^{1/y}, x!$ ,  $\sqrt[n]{x}, nPr, nCr$ , etc.)

In the vicinity of a function's singular point and point of inflection, errors are cumulative and may become large.

### Calculation Capacity:

- Input/Basic Calculations  
10-digit mantissa; or 10-digit mantissa plus 2-digit exponent up to  $10^{99}$

### Specifications

Power Supply: Solar cell

Operating Temperature:  $0^\circ\text{C} - 40^\circ\text{C}$  ( $32^\circ - 104^\circ\text{F}$ )

Dimensions: 10 (H) × 71 (W) × 134 (D) mm  
3/8" (H) × 2-3/4" (W) × 5-1/4" (D)

Weight: 60g (2.1oz)

 CASIO Europe GmbH  
Bombach 10, 22848 Norderstedt,  
Germany

 This mark applies in EU countries only.

CASIO COMPUTER CO., LTD.  
6-2, Hon-machi 1-chome,  
Shibuya-ku, Tokyo 151-8543, Japan

RCA503430-001V01