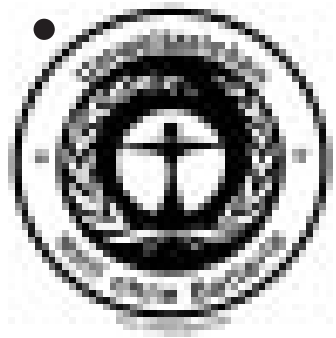
fx-82SOLAR
fx-85B
fx-260SOLAR
fx-280



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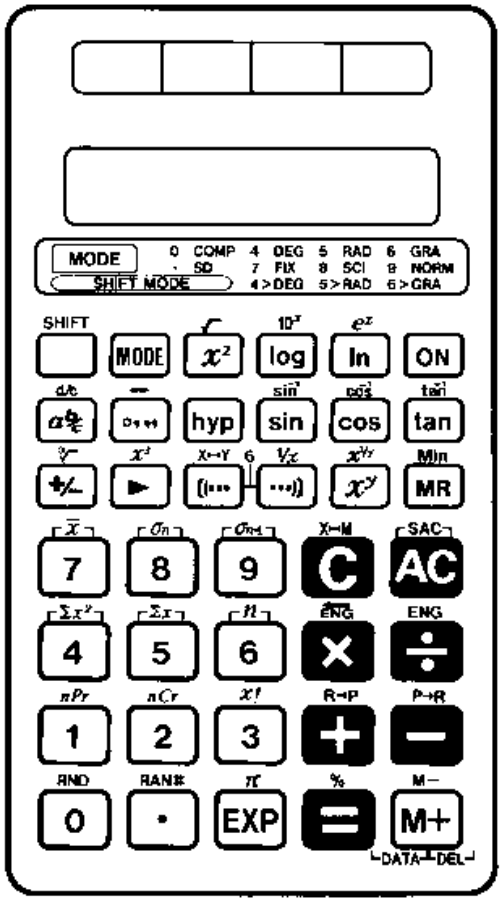
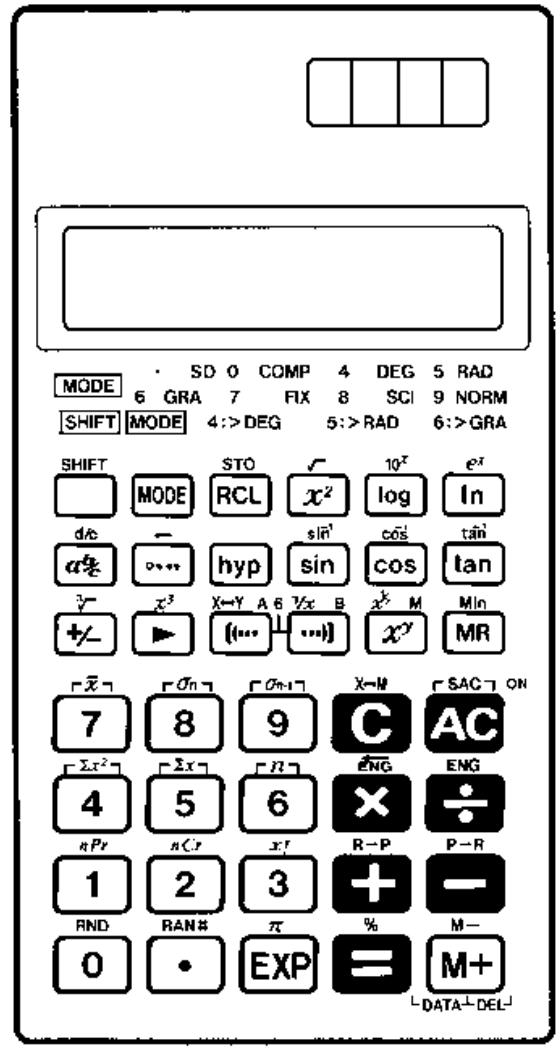
CASIO®



fx-82SOLAR/
fx-260SOLAR



fx-85B/fx-280

ENGLISH	1	*DEUTSCH*	110
ESPAÑOL	36	*ITALIANO*	147
FRANÇAIS	73		

CASIO ELECTRONICS CO., LTD.
Unit 6, 1000 North Circular Road,
London NW2 7JD, U.K.

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Handling Precautions

- 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.
- Never leave the dead battery (fx-85B/fx-280) in the battery compartment. It can leak and damage the unit.
- Avoid using volatile liquids such as thinner or benzine 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 battery replacement (fx-85B/fx-280), or insufficient light. The user should prepare physical records of data to protect against such data loss.
- Never dispose of battery (fx-85B/fx-280), the liquid crystal panel, or other components by burning them.
- Before assuming malfunction of the unit, be sure to care-

fully reread this manual and ensure that the problem is not due to low battery power (fx-85B/fx-280) or 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.
- Keep this manual on hand for future reference.

Modes

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

* Display indicators show current mode setting. Absence of display indicator indicates COMP Mode.

Note!

- A mode guide is located at the top of the display screen.
- DEG, RAD, and GRA modes can be used in combination with COMP and SD modes.
- MODE 9 does not exit SD mode.
- MODE 0 exits SD mode.
- MODE 0 does not clear SCI or FIX specifications.
- Always press AC before entering DEG, RAD, and GRA modes.
- Remember to always set the operating mode and angular unit (DEG, RAD, GRA) before starting your calculation.

Basic Calculations

- Use the COMP mode for basic calculations.
- **Example 1:** 23+4.5−53

  23 [+] 4.5 [−] 53 [=] → –25.5

- **Example 2:** 56×(−12)÷(−2.5)

  56 [×] 12 [+/−] [÷] 2.5 [+/−] [=] → 268.8

- **Example 3:** $2\div3\times(1\times10^{20})$

  2 [÷] 3 [×] 1 [EXP] 20 [=] → 6.666666667^{19}

- **Example 4:** 7×8−4×5=36

  7 [×] 8 [−] 4 [×] 5 [=] → 36.

- **Example 5:** $\frac{6}{4\times5}$ =0.3

  4 [×] 5 [÷] 6 [SHIFT] [X↔Y] [=] → 0.3

- **Example 6:** 2×[7+6×(5+4)]=122

  2 [×] [(···] 7 [+] 6 [×]

  [(···] 5 [+] 4 [···)] [···)] [=] → 122.

- You can skip all [···)] operations before the [=] key.

- **Example 7:** $4/3\pi 5^3$

4 ÷ 3 × SHIFT π × 5 SHIFT x^3 = | 523.5987756

Constant Calculations

- Press +, −, × 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) 2.3 + + 3 = | K 5.3

(2.3+6) 6 = | K 8.3

- **Example 2:** 12×2.3, then 12×(−9)

(12×2.3) 12 × × 2.3 = | K 27.6

(12×(−9)) 9 +/− = | K −108.

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

(17+17) 17 + + = | K 34.

(17+17+17) = | K 51.

(17+17+17+17) = | K 68.

- **Example 4:** $1.7^4 = 8.3521$

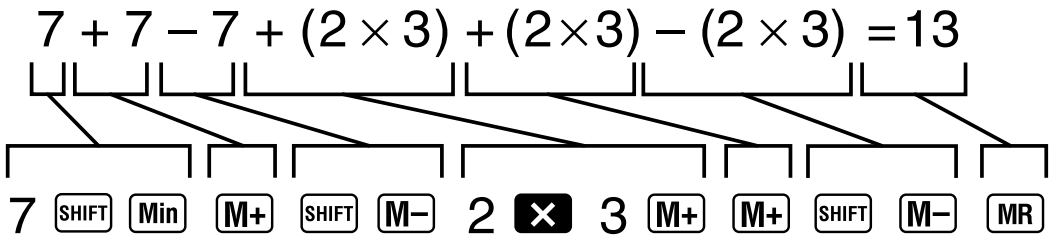
(1.7^2)	1.7 × × =	K 2.89
(1.7^3)	=	K 4.913
(1.7^4)	=	K 8.3521

Memory Calculations

- Use the COMP mode for memory calculations.
- Use SHIFT Min, M+, SHIFT 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:** $(53+6)+(23-8)+(56\times2)+(99\div4)=210.75$

$(53+6)$	53 + 6 = SHIFT Min	M 59.
$(23-8)$	23 − 8 M+	M 15.
(56×2)	56 × 2 M+	M 112.
$(99\div4)$	99 ÷ 4 M+	M 24.75
(Memory recall)	MR	M 210.75

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



M	13.

- **Example 3:** To calculate the following using memory and a constant: (12×3)−(45×3)+(78×3)=135.

(12×3)	3 × × 12 = SHIFT Min	MK 36.
(45×3)	45 SHIFT M−	MK 135.
(78×3)	78 M+	MK 234.
(Memory recall)	MR	MK 135.

■Additional fx-85B/fx-280 Memory Calculations

- The fx-85B/fx-280 has two additional memories named A and B.
- Use SHIFT STO to store data and RCL to recall data.
- Storing data in a memory replaces anything stored there previously.
- To clear a memory, store a zero in it.

- **Example 1:** To input 123 in memory A.

AC 123 SHIFT STO A	123.

AC RCL A | 123.

- **Example 2:** To store the results of 123 × 456 in memory B.

AC 123 × 456 SHIFT STO B | 56088.

AC RCL B | 56088.

Fraction Calculations

- Use COMP mode for fraction calculations.
- Total number of digits (including division marks) cannot exceed 10.
- **Example 1:** $\frac{2}{3}+\frac{4}{5}=1\frac{7}{15}$

2 $a\frac{b}{c}$ 3 + 4 $a\frac{b}{c}$ 5 = | 1⌟7⌟15.

- **Example 2:** $3\frac{1}{4}+1\frac{2}{3}=4\frac{11}{12}$

3 $a\frac{b}{c}$ 1 $a\frac{b}{c}$ 4 +

1 $a\frac{b}{c}$ 2 $a\frac{b}{c}$ 3 = | 4⌟11⌟12.

- **Example 3:** $\frac{2}{4}=\frac{1}{2}$ 2 $a\frac{b}{c}$ 4 | 2⌟4.

= | 1⌟2.

- **Example 4:** $\frac{1}{2}+1.6=2.1$

1 $a\frac{b}{c}$ 2 + 1.6 = | 2.1

Fraction/decimal calculation result is always decimal.

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

1 $a\frac{b}{c}$ 2 =	1⌟2.
$a\frac{b}{c}$	0.5
$a\frac{b}{c}$	1⌟2.

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

1 $a\frac{b}{c}$ 2 $a\frac{b}{c}$ 3	1⌟2⌟3.
SHIFT d/c	5⌟3.
SHIFT d/c	1⌟2⌟3.

Percentage Calculations

- Use COMP mode for percentage calculations.
- **Example 1:** To calculate 12% of 1500.

1500 × 12 SHIFT %	180.

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

660 ÷ 880 SHIFT %	75.

- **Example 3:** To add 15% onto 2500.

2500 × 15 SHIFT % +	2875.

- **Example 4:** To discount 3500 by 25%.

3500 × 25 SHIFT % − | 2625.

- **Example 5:** To calculate the following using a constant.
  12% of 1200 = 144
  18% of 1200 = 216
  23% of 1200 = 276

(12%) 1200 × × 12 SHIFT % | K 144.

(18%) 18 SHIFT % | K 216.

(23%) 23 SHIFT % | K 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.
- π =3.1415926536.

■Sexagesimal Functions

- **Example 1:** 14°25’36” + 12°23’34” = 26°49’10”

14 ° ’ ” 25 ° ’ ” 36 ° ’ ” +

12 ° ’ ” 23 ° ’ ” 34 ° ’ ” = | 26°49°10.

- **Example 2:** 1°2’3” + 4.56 = 5.594166667

1 [°’”] 2 [°’”] 3 [°’”] [+] 4.56 [=] → 5.594166667

- **Example 3:** sin 87°65’43.21” = 0.999447513 (DEG mode)

87 [°’”] 65 [°’”] 43.21 [°’”] [sin] → 0.999447513

- **Example 4:** 1.23↔ 1°13’48”

1.23 [°’”] → 1°13°48.

[°’”] → 1.23

[°’”] → 1°13°48.

- **Example 5:** 12°34’ ↔ 12.56666667

12 [°’”] 34 [°’”] [SHIFT] [$\overleftarrow{°’”}$] → 12.56666667

You can also use [°’”] when inputting values to convert between sexagesimal and decimal.

■Trigonometric/Inverse Trigonometric Functions

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

[SHIFT] [π] [÷] 6 [=] [sin] → RAD 0.5

- **Example 2:** cos 63°52’41” (DEG mode)

63 [°’”] 52 [°’”] 41 [°’”] [cos]

- **Example 3:** tan (−35gra)(GRA mode)

35 [+/−] [tan]

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

2 [SHIFT] [√] [÷] 2 [=] [SHIFT] [$\cos^{-1}$]

- **Example 5:** To convert 45 degrees to radians, grads, and back to degrees.

[MODE] [4] 45

[SHIFT] [MODE] [5]

[SHIFT] [MODE] [6]

[SHIFT] [MODE] [4]

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 — 3.6 [hyp] [sin] → 18.28545536

- **Example 2:** $\sinh^{-1} 30$ — 30 [hyp] [SHIFT] [$\sin^{-1}$] → 4.094622224

■Common and Natural Logarithms, Exponents

- **Example 1:** log 1.23 — 1.23 [log] → 0.089905111

- **Example 2:** ln 90 ($=\log_e 90$) — 90 [ln] → 4.49980967

- **Example 3:** $\frac{\log 64}{\log 4}$ — 64 [log] [÷] 4 [log] [=] → 3.

- **Example 4:** $10^{0.4}+5\,e^{-3}$

  .4 [SHIFT] [10^x] [+]

  5 [×] 3 [+/−] [SHIFT] [e^x] [=] → 2.760821773

- **Example 5:** 2^3 — 2 [x^y] 3 [=] → 8.

- **Example 6:** 2^{-3} — 2 [x^y] 3 [+/−] [=] → 0.125

- **Example 7:** e^{10} — 10 [SHIFT] [e^x] → 22026.46579

- **Example 8:** log sin 40° + log cos 35° (DEG mode)

40 [sin] [log] [+] 35 [cos] [log] [=]

DEG
–0.278567983

To convert to antilogarithm: [SHIFT] [10^x]

DEG
0.526540784

- **Example 9:** $8^{1/3}$ 8 [SHIFT] [$x^{1/y}$] 3 [=]

2.

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

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

2 [SHIFT] [$\sqrt{\ }$] [+] 3 [SHIFT] [$\sqrt{\ }$] [×] 5 [SHIFT] [$\sqrt{\ }$] [=]

5.287196909

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

5 [SHIFT] [$\sqrt[3]{\ }$] [+] 27 [+/–] [SHIFT] [$\sqrt[3]{\ }$] [=]

–1.290024053

- **Example 3:** $123+30^2$

123 [+] 30 [x^2] [=]

1023.

- **Example 4:** $\dfrac{1}{\frac{1}{3}-\frac{1}{4}}$

3 [SHIFT] [$1/x$] [–] 4 [SHIFT] [$1/x$] [=]

[SHIFT] [$1/x$]

12.

- **Example 5:** 8! 8 [SHIFT] [x!] → 40320.

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

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

[MODE] [7] [2] → FIX 0.00

1.234 [+] 1.234 [=] → FIX 2.47

- **Example 2:** 1.234+1.234, rounding input to two places.

[MODE] [7] [2] 1.234 [SHIFT] [RND] [+]

1.234 [SHIFT] [RND] [=] → FIX 2.46

- Press [MODE] [9] to clear FIX specification.

- **Example 3:** 1÷ 3 , displaying result with two significant digits (SCI 2).

[MODE] [8] [2] → SCI 0.0^{00}

1 [÷] 3 [=] → SCI 3.3^{-01}

- Press [MODE] [9] to clear SCI specification.

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

56088 [SHIFT] [ENG] → 56.088 ^{03}

- **Example 5:** To convert 0.08125 grams to milligrams.

.08125 [SHIFT] [ENG] → 81.25^{-03}

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

Example (results differ each time) [SHIFT] [RAN#] → 0.664

■Coordinate Conversion

- **Example 1:** To convert polar coordinates (r=2, θ=60°) to rectangular coordinates (x, y). (DEG mode)

x 2 [SHIFT] [P→R] 60 [=] → DEG 1.

y [SHIFT] [X↔Y] → DEG 1.732050808

[SHIFT] [X↔Y] swaps displayed value with value in memory.

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

r 1 [SHIFT] [R→P] 3 [SHIFT] [√] [=] → RAD 2.

θ [SHIFT] [X↔Y]

RAD
1.047197551

■Permutation

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

7 [SHIFT] [nPr] 4 [=]

840.

■Combination

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

10 [SHIFT] [nCr] 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 σ_{n-1}, σ_n, $\bar{x}$, n, Σx, and Σx^2 for the following data : 55, 54, 51, 55, 53, 53, 54, 52.

Enter SD Mode. [MODE] [•]

SD
0.

Input Data.	[SHIFT] [SAC] 55 [DATA] 54 [DATA] 51 [DATA] 55 [DATA] 53 [DATA] [DATA] 54 [DATA] 52 [DATA]	SD 52.
Sample standard deviation	[SHIFT] [$\sigma n-1$]	SD 1.407885953
Population standard deviation	[SHIFT] [σn]	SD 1.316956719
Arithmetic mean	[SHIFT] [$\bar{x}$]	SD 53.375
Number of data	[SHIFT] [n]	SD 8.
Sum of values	[SHIFT] [Σx]	SD 427.
Sum of squares of values	[SHIFT] [Σx^2]	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 DATA	50 DATA	SHIFT DEL 51 DATA
130 × 31 DATA	120 ×	AC 130 × 31 DATA
130 × 31 DATA	120 × 31	AC 130 × 31 DATA

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

Correct	Actual	Correction
51 DATA	49 DATA	49 SHIFT DEL 51 DATA
130 × 31 DATA	120 × 30 DATA	120 × 30 SHIFT DEL 130 × 31 DATA

Technical Information

■Keys and Their Functions

• General

Arithmetic calculations ..... [+], [−], [×], [÷], [=]

Backspace ..... [▶]

Clear(retains memory) ..... [C]

Number input ..... [0] – [9], [•]

Power on; All clear ..... [AC]

Sign change ..... [+/−]

• Memory

Memory in ..... [SHIFT] [Min]

Memory minus ..... [SHIFT] [M−]

Memory plus ..... [M+]

Memory recall ..... [MR]

• fx-85B/fx-280 Memory

Memory A recall ..... [RCL] [A]

Memory B recall ..... [RCL] [B]

Memory M recall ..... [RCL] [M]

Memory A store ..... [SHIFT] [STO] [A]

Memory B store ..... SHIFT STO B
Memory M store ..... SHIFT STO M

• Special

Display/memory swap ..... SHIFT X↔Y,
SHIFT X↔M

Exponent ..... EXP
Internal rounding ..... SHIFT RND
Parentheses ..... [(··· , ···)]
Pi (3.1415926536) ..... SHIFT π
Select mode ..... MODE
Sexagesimal ..... °’” , SHIFT °’”
Shifts key functions ..... SHIFT

• Scientific Functions

Arc cosine ..... SHIFT cos⁻¹
Arc sine ..... SHIFT sin⁻¹
Arc tangent ..... SHIFT tan⁻¹
Common antilogarithm ..... SHIFT 10^x
Common logarithm ..... log
Convert to degrees ..... SHIFT MODE 4
Convert to grads ..... SHIFT MODE 6
Convert to radians ..... SHIFT MODE 5
Cosine ..... cos

Cube ..... SHIFT x^3

Cube root ..... SHIFT $\sqrt[3]{}$

Engineering ..... SHIFT ENG,
SHIFT ENG

Factorial ..... SHIFT $x!$

Fraction ..... $a\frac{b}{c}$

Fraction ..... SHIFT d/c

Hyperbolic ..... hyp

Natural antilogarithm ..... SHIFT e^x

Natural logarithm ..... ln

Percent ..... SHIFT %

Polar-to-rectangular ..... SHIFT P→R

Power ..... x^y

Random number ..... SHIFT RAN#

Reciprocal ..... SHIFT $1/x$

Rectangular-to-polar ..... SHIFT R→P

Root ..... SHIFT $x^{1/y}$

Sine ..... sin

Square ..... x^2

Square root ..... SHIFT $\sqrt{}$

Tangent ..... tan

Permutation ..... SHIFT nPr

Combination ..... SHIFT nCr

• Statistics (SD Mode)

Arithmetic mean ..... SHIFT $\bar{x}$

Data delete ..... SHIFT DEL

Data input ..... DATA

Number of data ..... SHIFT n

Population standard deviation ..... SHIFT σn

Sample standard deviation ..... SHIFT $\sigma n{-}1$

Statistical register clear ..... SHIFT SAC

Sum of squares of values ..... SHIFT Σx^2

Sum of values ..... SHIFT Σx

■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 ÷ 200 =

NORM 1 format

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.

1. MODE 0 (COMP mode)
2. MODE 4 (DEG mode)
3. MODE 9 (NORM mode)
4. Check the formula you are working with to confirm it is correct.
5. 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^y, SHIFT $\sqrt[y]{x}$, 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.

a. When a result (whether intermediate or final) or a total accumulated in memory is greater than $\pm 9.999999999 \times 10^{99}$. ("–E–" indicator appears on the display.)
b. When function calculations are performed using a value that exceeds the input range. ("–E–" indicator appears on the display.)
c. When an illogical operation (such as an attempt to calculate $\bar{x}$ and σ_n while $n = 0$) is performed during statistical calculations. ("–E–" indicator appears on the display.)
d. When an illegal mathematical operation (such as division by zero) is performed. ("–E–" indicator appears on display.)
e. The total number of nested parentheses levels exceeds six, or when more than 18 pairs of parentheses are used. ("– [–" 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 $+(1\times10^{-99})$to $-(1\times10^{-99})$. Instead, the display shows all zeros.

■Power Supply

- **fx-82SOLAR/fx-260SOLAR**

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.

- **fx-85B/fx-280**

This calculator is powered by the CASIO TWO- WAY POWER system, which makes it possible for the calculator to operate even in total darkness.

- The calculator retains memory contents no matter what the lighting conditions.
- The TWO-WAY POWER system uses two power sources: a solar cell and a single G13 Type (SR44 or LR44) battery.
- Weak battery power is indicated when memory contents spontaneously clear, or when the display darkens under poor light and cannot be restored by pressing ON.

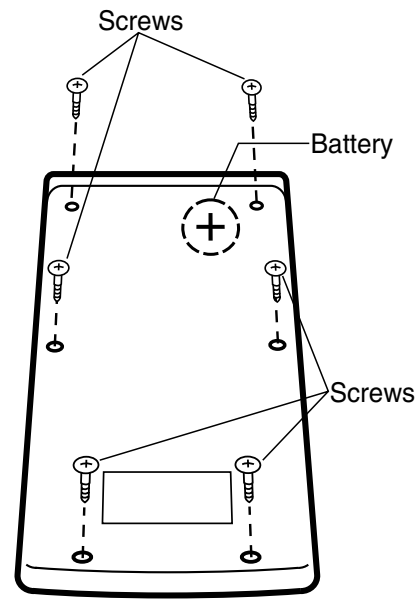
Important!

Incorrect use of batteries can cause them to burst or leak, possibly damaging the calculator.

- Be sure to replace the battery at least once every three years, regardless of how much the calculator is used. Old batteries may leak, causing serious damage to the interior of the calculator.
- The battery that comes with the calculator when you purchase it is for testing only. It may not provide full service life.
- Low bettery power can cause memory contents to become corrupted or lost completely. Always keep written records of all important data.
- Always be sure to load the battery with its positive (+) side facing up (so you can see it).
- Never try to charge batteries, take them apart, or allow them to become shorted. Keep batteries away from direct flame and heat.
- ***Keep batteries out of the reach of small children. If swallowed, consult with your physician immediately.***

To replace the battery

1. Remove the screws that hold the back cover in place, and then remove the cover.
2. Remove the old battery.
3. Install a new battery, making sure that the positive (+) side is facing up (so you can see it).
4. Replace the back cover and secure it in place with the screws.



5. Press AC to turn power on.

■Order of Operations and Levels

Operations are performed in the following order of precedence.

1. Functions
2. x^y, $x^{1/y}$, R →P, P →R, nPr, nCr
3. ×, ÷
4. +, −

- 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_1 through L_6 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 on the next page shows register contents following the above input.

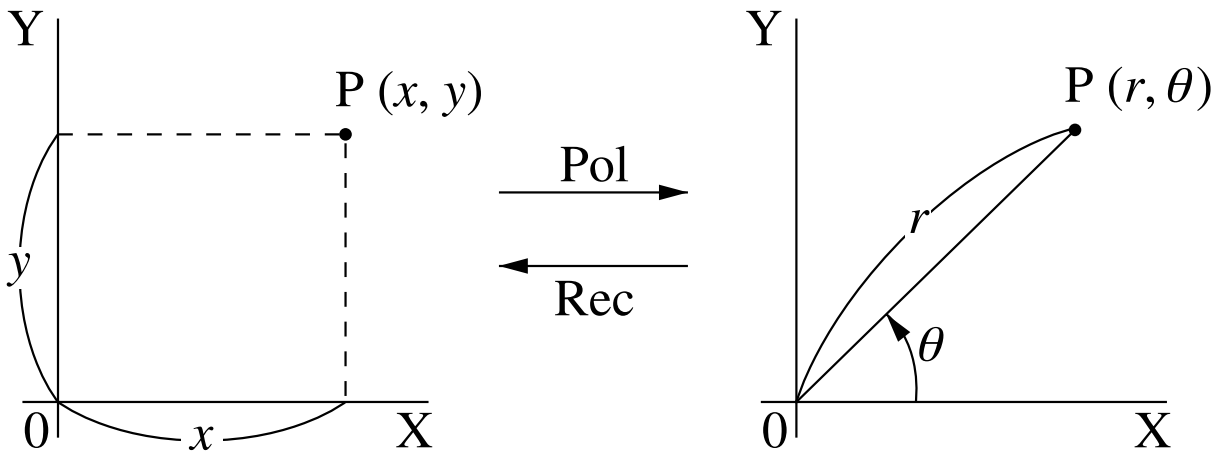
Register	Contents
x	4
L_1	((5 +
L_2	4 ×
L_3	(((3 +
L_4	2 ×
L_5	
L_6	

■Formulas, Ranges, and Conventions

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

Coordinate Transformation

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



Permutation

- Input range: $n \geq r \geq 0$ (n, r : integers)
- Formula: ${}_n\mathrm{P}_r = \dfrac{n!}{(n-r)!}$

Combination

- Input range: $n \geq r \geq 0$ (n, r : integers)
- Formula: ${}_n\mathrm{C}_r = \dfrac{n!}{n!(n-r)!}$

Population Standard Deviation

$$\sigma n = \sqrt{\frac{\sum_{i=1}^{n} (xi - \bar{x})^2}{n}} = \sqrt{\frac{\Sigma x^2 - (\Sigma x)^2 / n}{n}}$$

Sample Standard Deviation

$$\sigma n - 1 = \sqrt{\frac{\sum_{i=1}^{n} (xi - \bar{x})^2}{n-1}} = \sqrt{\frac{\Sigma x^2 - (\Sigma x)^2 / n}{n-1}}$$

Arithmetic Mean

$$\bar{x} = \frac{\sum_{i=1}^{n} xi}{n} = \frac{\Sigma x}{n}$$

■Specifications

Power Supply :

fx-82SOLAR/fx-260SOLAR : Solar cell

fx-85B/fx-280 : CASIO TWO-WAY POWER System: solar cell plus one G13 Type (SR44 or LR44) battery

Battery Life (fx-85B/fx-280) :

Approximately 3 years (1 hour use per day) on LR44/SR44 battery

Input Ranges :

<table>
<tr><th>Functions</th><th colspan="3">Input Range</th></tr>
<tr><td>$\sin x$
$\cos x$
$\tan x$</td><td colspan="2">(DEG) $|x|<9\times10^{9}$
(RAD) $|x|<5\times10^{7}\pi$ rad
(GRA) $|x|<1\times10^{10}$ grad</td><td>However, for tan x:
$|x|\neq 90(2n+1)$:DEG
$|x|\neq \pi/2\cdot(2n+1)$:RAD
$|x|\neq 100(2n+1)$:GRA</td></tr>
<tr><td>$\sin^{-1}x$
$\cos^{-1}x$</td><td colspan="3">$|x|\leq 1$</td></tr>
<tr><td>$\tan^{-1}x$</td><td colspan="3">$|x|< 1\times10^{100}$</td></tr>
<tr><td>$\sinh x$
$\cosh x$</td><td colspan="2">$|x|\leq 230.2585092$</td><td rowspan="2">For sinh and tanh,errors are cumulative and accuracy is affected at a certain point when x=0.</td></tr>
<tr><td>$\tanh x$</td><td colspan="2">$|x|< 1\times10^{100}$</td></tr>
<tr><td>$\sinh^{-1}x$</td><td colspan="3">$|x|< 5\times10^{99}$</td></tr>
<tr><td>$\cosh^{-1}x$</td><td colspan="3">$1\leq x< 5\times10^{99}$</td></tr>
</table>

Functions	Input Range
$\tanh^{-1}x$	$\lvert x\rvert < 1$
$\log x/\ln x$	$1\times 10^{-99} \le x < 1\times 10^{100}$
10^x	$-1\times 10^{100} < x < 100$
e^x	$-1\times 10^{100} < x \le 230.2585092$
$\sqrt{x}$	$0 \le x < 1\times 10^{100}$
x^2	$\lvert x\rvert < 1\times 10^{50}$
x^3	$\lvert x\rvert < 2.154434690\times 10^{33}$
$1/x$	$\lvert x\rvert < 1\times 10^{100}$; $x \ne 0$
$\sqrt[3]{x}$	$\lvert x\rvert < 1\times 10^{100}$
$x!$	$0 \le x \le 69$ (x is an integer)
$n\mathrm{P}r/n\mathrm{C}r$	$0 \le r \le n$ $n < 1\times 10^{10}$ (n and r are integers)
R→P	$\sqrt{x^2+y^2} < 1\times 10^{100}$
P→R	$0 \le r < 1\times 10^{100}$ (DEG) $\lvert\theta\rvert < 9\times 10^9$ (RAD) $\lvert\theta\rvert < 5\times 10^7\pi$ rad (GRA) $\lvert\theta\rvert < 1\times 10^{10}$ grad However, for $\tan\theta$: $\lvert\theta\rvert \ne 90(2n+1)$:DEG $\lvert\theta\rvert \ne \pi/2\cdot(2n+1)$:RAD $\lvert\theta\rvert \ne 100(2n+1)$:GRA
°’ ”	**Input and Results** Total of hour, minutes, and seconds digits must be 10 or fewer (including separator symbols). Decimal ↔ Sexagesimal Conversions $\lvert x\rvert \le 2777777.777$

Functions	Input Range
x^y	$x > 0$: $-1\times10^{100} < y \log x < 100$ $x = 0$: $y > 0$ $x < 0$: $y = n$; $\frac{1}{2n+1}$ (n is an integer) However: $-1\times10^{100} < y \log \lvert x\rvert < 100$
$x^{1/y}$	$x > 0$: $y \neq 0$ $-1\times10^{100} < 1/y \log x < 100$ $x = 0$: $y > 0$ $x < 0$: $y = 2n+1$; $\frac{1}{n}$ ($n \neq 0$; n is an integer) However: $-1\times10^{100} < 1/y \log \lvert x\rvert < 100$
$a\,b/_c$	Total of integer, numerator, and denominator must be 10 digits or less(including division marks).
SD	$\lvert x\rvert < 1\times10^{50}$ $\lvert n\rvert < 1\times10^{100}$ σ_n , $\bar{x}$: $n \neq 0$ σ_{n-1} : $n \neq 0, 1$

- Errors are cumulative with such internal continuous calculations as x^y, $x^{1/y}$, $x!$, and $\sqrt[3]{x}$, so accuracy may be adversely affected.

Operating Temperature: 0°C–40°C (32°F–104°F)

Dimensions:

fx-82SOLAR/fx-260SOLAR:

8(H)×66.5(W)×125(D) mm
5/16"(H)×2-5/8"(W)×4-15/16"(D)

fx-85B/fx-280:

13.5(H)×73(W)×144.5(D) mm
1/2"(H)×2-7/8"(W)×5-5/8"(D)

Weight:

fx-82SOLAR/fx-260SOLAR:

47 g (1.7oz)

fx-85B/fx-280:

67 g (2.4oz) including battery

Calculation Capacity:

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

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