

• After reading this manual, store it in a convenient location for future reference.

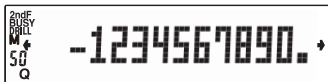
OPERATION NOTES (FOR THE SUPERVISING ADULT)

- Do not apply excessive pressure to the LCD panel, as it contains glass and may be damaged.
- Product specifications and accessories are subject to change without prior notice due to product improvements.
- This product is not waterproof. Do not use or store it in locations where liquids may splash onto it. Exposure to rain, water spray, juice, coffee, steam, perspiration, or similar substances may cause malfunction.
- For your health and comfort, avoid using this product for extended periods of time. When prolonged use is necessary, allow regular rest breaks for your eyes, hands, arms, and body (approximately 10–15 minutes per hour). If you experience pain or fatigue, stop using the product immediately. If symptoms persist, consult a medical professional.

SHARP will not be liable nor responsible for any incidental or consequential economic or property damage caused by misuse and/or malfunctions of this product and its peripherals, unless such liability is acknowledged by law.

- Press the RESET switch (on the front), with the tip of a ball-point pen or similar object, only in the following cases. **Do not use an object with a breakable or sharp tip.**
 - When using for the first time
 - After replacing the battery
 - When an abnormal condition occurs and keys do not respond
- Note that pressing the RESET switch will erase the memory (M).

DISPLAY



- During actual use, not all symbols are displayed at the same time.
- Only the symbols required for the usage under instruction are shown in the display and calculation examples.

- ↔ / →** : Indicates that some contents are hidden in the directions shown. Press **◀** or **▶** to display the hidden contents.
- 2ndF** : Appears when **2ndF** is pressed, indicating that the functions shown in the same color as **2ndF** are enabled.
- DRILL** : Indicates that the DRILL mode is selected.
- 0 25 50** : Indicate the number of the questions.
- BUSY** : Appears such as during the execution of a calculation.
- M** : Indicates that a numerical value is stored in the memory (M).

BEFORE USING THE CALCULATOR

Press **ON/C** to turn the calculator on. The entry that was on-screen will appear on the display, when the power was turned off automatically. Press **2ndF OFF** to turn it off.

Key notation used in this manual

- π** : To specify π: **2ndF π**
- +** : To specify +: **+**
- a b/c** : To specify a b/c: **2ndF ab/c**
- a/b** : To specify a/b: **a/b**

- Functions that are printed in black adjacent to the keys are effective in DRILL mode (**DRILL**, etc.).

Mode selection

NORMAL mode

- Select the NORMAL mode to perform basic calculations and scientific calculations. To switch from the DRILL mode to the NORMAL mode, press **2ndF HOME**. (If a question is not displayed on the screen, press **ON/C**.)

DRILL mode

- Select the DRILL mode to perform the DRILL functions. Press **DRILL** to enter the DRILL mode.

Automatic power off function

To conserve battery power, the calculator will automatically turn off after approximately 7 minutes of inactivity.

BASIC CALCULATIONS

Basic arithmetic calculations use the arithmetic operator keys (**+**, **-**, **×**, **÷**) and the **=** key.

- Before performing a calculation, press **ON/C** to clear the entries.
- By inserting parentheses (**()**), calculations inside the parentheses are performed first.

123 + 45 × 2.5 ÷ 3 =	ON/C 123 + 45 × 2.5 ÷ 3 =	160.5
4 + 8 × 7 - 3 ÷ 2 =	4 + 8 × 7 - 3 ÷ 2 =	58.5
(4 + 8) × (7 - 3) ÷ 2 =	(4 + 8) × (7 - 3) ÷ 2 =	24.

- The calculator enables you to repeat a basic operation (+, -, × and ÷) with a constant. In constant calculations, the addend becomes a constant. Subtraction and division are performed in the same manner. For multiplication, the multiplicand becomes a constant.

34 + 57 =	ON/C 34 + 57 =	91.
45 + 57 =	45 + 57 =	102.
68 × 25 =	68 × 25 =	1700.
68 × 40 =	68 × 40 =	2720.

- The previous calculation result can be used in the subsequent calculation (chain calculations).

6 + 4 = 10	ON/C 6 + 4 =	10.
10 + 5 =	10 + 5 =	15.
8 × 2 = 16	8 × 2 =	16.
16 ² =	16 × 16 =	256.

Note:

- The calculation result is displayed by rounding off the 11th digit.
- In chain calculations, the previous calculation result is used without rounding.

Memory calculations

This calculator has one memory (M). By using the memory, you can perform memory calculations.

The functions of the keys are as follows:

- 2ndF CM** (the **7** key): Clears the memory contents.
- 2ndF RM** (the **8** key): Recalls the memory contents.
- 2ndF M-** (the **9** key): A value can be subtracted from an existing memory value.
- 2ndF M+** (the **=** key): A value can be added to an existing memory value.

25 × 5 = 125	ON/C 25 × 5 =	M	125.
-) 84 ÷ 3 = 28	84 ÷ 3 =	M	28.
+) 68 + 17 = 85	68 + 17 =	M	85.
182	2ndF RM	M	182.
	2ndF CM	M	182.
8 × 2 = 16	8 × 2 =	M	16.
24 ÷ (8 × 2) =	24 ÷ (8 × 2) =	M	1.5
(8 × 2) × 5 =	(8 × 2) × 5 =	M	80.

Note:

- The contents of memory (M) are retained when the calculator is turned off (including the automatic power off).
- The contents of memory (M) may change because of battery replacement or consumption, etc.

ENTERING, EDITING THE EQUATION

Entering the equation

You can enter and display equations as you would write them, including fractions, $\sqrt{\quad}$ and π .

$\frac{2}{5} + \frac{3}{4} =$	ON/C 2 a/b 5 ▶ + 3 a/b 4 =	1.3
$\sqrt{3} \times \sqrt{5} =$	2ndF $\sqrt{\quad}$ 3 ▶ × 2ndF $\sqrt{\quad}$ 5 =	3.872983346
45 + 285 ÷ 3 =	45 + 285 ÷ 3 =	140.
42 × -5 + 120 =	42 × (-) 5 + 120 =	-90.

Note:

Numbers, arithmetic operations (+, -, × and ÷), minus sign and parentheses can be entered in the entry of fractions and $\sqrt{\quad}$.

Editing the equation

Press **BACK SPACE** to delete it from the end of the equation. To delete a number or function, move the cursor to the right of it by pressing **◀** or **▶**, then press **BACK SPACE**.

Playback function

Just after obtaining an answer, pressing **◀** brings you to the end of the equation and pressing **▶** brings you to the beginning of the equation.

3 × 5 + 2 =	ON/C 3 × 5 + 2 =	17.
3 × (5 + 2) =	3 × (5 + 2) =	21.

Priority levels in calculation

This calculator performs operations according to the following priority:

- Fractions
 - Functions preceded by their argument (x^2 , x^3 , (%))
 - $\sqrt{\quad}$, $\sqrt[3]{\quad}$
 - Implied multiplication (2 π , etc.)
 - GCD, LCM
 - \times , \div , $+$, $-$, $=$, %
- Calculations which are given the same priority level are executed in sequence.
 - If parentheses are used, parenthesized calculations have precedence over any other calculations.

SCIENTIFIC CALCULATIONS

Before performing a calculation, press **ON/C** to clear the entries.

Fraction calculations

When arithmetic operations using fractions can be performed, calculation results will be displayed using fractions.

The **a/b** key (**2ndF ab/c** for mixed fraction) is used in fraction calculations.

In fraction calculations, including division calculations, conversion of the calculation result can be performed by pressing **CHANGE**.

When you press **CHANGE**, the calculation result will cycle through the following display styles:

- Mixed fractions → improper fractions → decimal numbers
- Proper fractions → decimal numbers

Note:

- Improper/proper fractions will be converted to and displayed as decimal numbers if the number of digits used in their expression is greater than nine. In the case of mixed fractions, the maximum number of displayable digits (including integers) is eight.

$3\frac{1}{2} + \frac{4}{3} =$	ON/C 3 2ndF a/b/c 1 ▶ 2 ▶ + 4 =	4.5
	a/b 3 ▶ =	29
	CHANGE	6
	CHANGE	4.833333333
7 ÷ 5 =	7 ÷ 5 =	1.4
	CHANGE	1.2
	CHANGE	5
	CHANGE	7

Squares and cubes

The square of the number or the cube of the number is calculated by using **2ndF X²** (the **÷** key) or **2ndF X³** (the **)** key).

Calculate the square of 15.	ON/C 15 2ndF X² =	225.
Calculate the cube of 8.	8 2ndF X³ =	512.

Square roots and cube roots

The square root of the number or the cube root of the number is calculated by using **2ndF $\sqrt{\quad}$** (the **×** key) or **2ndF $\sqrt[3]{\quad}$** (the **()** key).

Calculate the square root of 49.	ON/C 2ndF $\sqrt{\quad}$ 49 =	7.
Calculate the cube root of 27.	2ndF $\sqrt[3]{\quad}$ 27 =	3.

% calculations

There are two types of % (percent) calculations.

- 2ndF (%)** (the **-** key) : When specified immediately after a value, the value is treated as a percentage.
- 2ndF %** (the **1** key) : You can perform premium, discount, and other calculations.

50 × 8 (%) + 100 =	ON/C 50 × 8 2ndF (%) + 100 =	104.
500 × 25% =	500 × 25 2ndF (%) =	125.
120 ÷ 400 = ?%	120 ÷ 400 2ndF (%) =	30.
500 + (500 × 25%) =	500 + (500 × 25 2ndF (%)) =	625.
400 - (400 × 30%) =	400 - (400 × 30 2ndF (%)) =	280.

Greatest common divisor (GCD)

Calculate the GCD of ON/C 24
24 and 36. 2ndF GCD 36 = **12.**

Lowest common multiple (LCM)

Calculate the LCM of ON/C 15
15 and 9. 2ndF LCM 9 = **45.**

Prime factorization

The calculation result can be shown as a product of prime numbers.

- A positive integer greater than 2 and no more than 10 digits can be factored into primes.
- A number that cannot be factored into a prime number with 3 digits or shorter is shown in parentheses.

12210 = ON/C 12210 = **12210.**
 2ndF PFACT **2×3×5×11×37**
 = **12210.**

1234567 = ON/C 1234567 = **1234567.**
 2ndF PFACT **127×(9721)**

Random function

Press 2ndF RANDOM (the 4 key) to display the Random function menu.

Random dice

To simulate a die-rolling, a random integer between 1 and 6 can be generated by pressing 2ndF RANDOM 1 = .

Random coin

To simulate a coin flip, 0 (heads) or 1 (tails) can be randomly generated by pressing 2ndF RANDOM 2 = .

Note:

To generate further random numbers in succession, press = . Press ON/C to exit.

π calculations

Pressing 2ndF π enters π (3.14159...).

$\pi \times 3^2 =$ ON/C 2ndF π 3 X = **28.27433388**
 3 2ndF X^2 =

DRILL MODE

You can do the four types of drills (exercises).

Drill type selection

Equality/inequality mode: DRILL 1

An equation of fractions, power functions and polynomials is randomly displayed.

Enter the correct symbol, that is equation symbol (=) or inequality symbols (<, >), at the cursor position.

=, < and > symbols are entered by pressing = , < and > (the 0 , . and (-) keys respectively).

Fraction calculations mode: DRILL 2

A conversion between numbers (fractions/decimals) is randomly displayed. There are four sub-modes;

- Improper fractions and mixed fractions
- Fractions and decimals
- Fractions and fractions
- All the above conversions

Time calculations mode: DRILL 3

A time calculation in 24-hour format of addition or subtraction is randomly displayed.

Enter the correct time in four digits at the cursor position.

Basic calculations mode: DRILL 4

A basic calculation of addition, subtraction, multiplication and division is randomly displayed. There are five sub-modes;

- Addition
- Subtraction
- Multiplication
- Division
- All the above calculations

Common operations

- Press DRILL to enter the DRILL mode.
- Select the drill type by pressing 1 - 4 .
 - Select the sub-mode in Fraction calculations mode and Basic calculations mode additionally.
- Select the number of questions (10, 25 or 50) by pressing < or > .
- Press = to start the drill.
- Enter your answer. Press BACK SPACE or ON/C to clear the entered number and then enter the answer again.
- Press ENTER (the = key).
 - If the answer is correct, " \checkmark " appears. Then press ENTER to display the next question.
 - If the answer is incorrect, " \times " appears. Then press ENTER to display the same question again.
 - If you press ENTER without entering an answer, the correct answer is displayed. This will be regarded as an incorrect answer. And then press ENTER to display the next question.
- Continue answering the series of questions by entering the answer and pressing ENTER .
- After you finish all questions, press ENTER and then the number and percentage of correct answers are displayed.
- Press ENTER to return to the initial screen (selection of the number of questions) for your current drill.
 - Press 2ndF HOME to quit.

An example (Fraction calculation mode)

ON/C DRILL 2 4 to do the drill of fraction calculations (ALL).
Select 10 questions and press = .

01? $\frac{46}{126} = \frac{63}{63}$

"01?" indicates the first question.

01? $\frac{46}{126} = \frac{23}{63}$

Enter your answer. Press 2 3 to enter "23".

01? $\frac{46}{126} = \frac{23}{63}$

Press ENTER (the = key). In this case, the answer is correct, so " \checkmark " appears. And press ENTER to display the next question.

Continue answering the series of questions by repeatedly entering the answer and pressing ENTER .

10 $\frac{5}{9} = 5.6$

The last question is finished.

Press ENTER to display the number and percentage of correct answers.

0/10 (80%)

Press 2ndF HOME to quit.

ERRORS AND CALCULATION RANGES

Errors

An error will occur if an operation exceeds the calculation ranges, or if a mathematically illegal operation is attempted. When an error occurs, pressing < or > automatically moves the cursor back to the place in the equation where the error occurred. Edit the equation or press ON/C to clear the equation.

Error codes and error types

ERROR 01: Syntax error

An attempt was made to perform an invalid operation.

Ex. $2 \text{ + } \text{X}$ 5 =

An input is not completed about fractions, $\sqrt{\quad}$, $\sqrt[3]{\quad}$, x^2 , x^3 .

ERROR 02: Calculation error

- The absolute value of the final calculation result equals or exceeds 10000000000.
- The absolute value stored in the memory (M) exceeds 10000000000.
- An attempt was made to divide by zero.
- The calculation ranges were exceeded while performing calculations.
- An attempt was made to factor a number other than positive integer of 2 or more (10 or less digits).

ERROR 03: Nesting error

- The available number of buffers was exceeded. (There are 8 buffers for numeric values and 16 buffers for calculation instructions).

Alert messages

Can't delete!

- The selected item cannot be deleted by pressing BACK SPACE .

Ex. 2ndF $\sqrt{\quad}$ 5 > 2ndF X^2 < BACK SPACE
In this example, delete the exponent before attempting to delete the parentheses.

Buffer full!

- The equation exceeded its maximum input buffer (80 characters).

Calculation ranges

- Within the ranges specified, this calculator is accurate to ± 1 of the least significant digit of the mantissa. However, a calculation error increases in continuous calculations due to accumulation of each calculation error. (This is the same for $\sqrt[3]{\quad}$, etc., where continuous calculations are performed internally.)

- Calculation ranges
 ± 0.0000000001 to ± 99999999999 and 0.

If the absolute value of an entry or a final result of a calculation is less than 0.0000000001, the value is considered to be 0 in calculations.

Function	Input range
\sqrt{x}	$0 \leq x$
nGCDn, nLCMn	$0 < n$ (n: integer)

BATTERY REPLACEMENT (REQUIRES ADULT SUPERVISION)

Information on Handling Batteries

Caution: This information covers risks that can lead to serious injury or property damage.

- Keep new and used batteries away from children. If a child swallows a battery, seek immediate medical attention.
- Improper use of batteries may cause battery leakage, causing severe injuries and damaging the device, or soiling hands and clothing. Improper handling of batteries may also lead to overheating, bursting, or catch fire.
- Should fluid from a leaking battery accidentally enters your eye, this could result in a serious injury. Should this occur, rinse eye with clean water and seek immediate medical attention.
- Should fluid from a leaking battery come in contact with your skin or clothes, immediately wash with clean water.
- Do not throw batteries in water or fire, dismantle them, or short-circuit the terminals.
- Make sure the battery is in the correct orientation.
- Do not charge the batteries that are built-in or included with the product. Do not use rechargeable batteries in this device.
- When disposing of batteries, insulate the terminals with tape (for example, use clear tape on the positive (+) and negative (-) sides) to prevent short-circuiting.
- When replacing batteries, use only the recommended battery type. If you are replacing multiple batteries, make sure they are all new and identical.

- Do not leave a discharged battery inside the product.
- If you do not use the products for some time, please remove the batteries to prevent leakage and keep them in a safe place.

When to replace the battery

If the display has poor contrast, the battery requires replacement.

- The battery is factory-installed before shipment, and may be exhausted before it reaches the service life stated in the specifications.

Replacement procedure

Battery should only be replaced under adult supervision.

- Turn the power off by pressing 2ndF OFF .
- Remove one screw. (Fig. 1)
- Lift the battery cover to remove.
- Remove the used battery by prying it out with a ball-point pen or other similar pointed device. (Fig. 2)
- Install one new battery. Make sure the "+" side is facing up. (Fig. 3)
- Replace the cover and screw.
- Press the RESET switch (on the front) with the tip of a ball-point pen or similar object.
- Make sure that the display appears as shown below. If the display does not appear as shown, remove the battery, reinstall it, and check the display once again.

Fig. 1

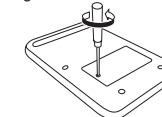


Fig. 2

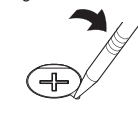


Fig. 3



STRAP HOLE (REQUIRES ADULT SUPERVISION)

A carrying strap can be attached on the upper right of the unit.

Caution:

- Do not swing the unit by the strap, or use excessive force to pull the strap. Doing so will cause a malfunction or hardware damage to the unit.

SPECIFICATIONS (FOR THE SUPERVISING ADULT)

Display of calculation results:

Internal calculations:	Up to 10 digits (decimal numbers)
Pending operations:	Mantissas of up to 12 digits 16 calculations 8 numeric values
Power source:	3.0V --- (DC): Lithium battery (CR2032) x1 Approx. 3 years (with 1 hour of daily use) Varies according to use and other factors.
Operating time:	Operating temperature: $0^{\circ}\text{C} - 40^{\circ}\text{C}$ ($32^{\circ}\text{F} - 104^{\circ}\text{F}$)
Operating temperature:	External dimensions: 78 mm (W) \times 120 mm (D) \times 16 mm (H)
External dimensions:	Weight: Approx. 75 g (Including battery)
Weight:	Accessories: Battery \times 1 (installed) and supplement sheet
Accessories:	

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