

Electronic Calculator



L163

Canon Canola L163

Instructions

English Edition

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The Canola L163 is a product of Canon's advanced micro-electronic technology and human engineering and is designed to give many years of reliable service. To make sure you take full advantage of its many special features, please read the instructions and work through the examples given in this manual before use.

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BEFORE STARTING CALCULATIONS SPECIFICATIONS

Type :

Desk-top electronic calculator with a carrying handle

Keyboard :

10-key system with magnet reed switch

Memory :

Two 16-digit capacity memories

Register :

Three calculating registers

Operational Digit :

	Numeral to be calculated	Calculating numeral	Result (Max.)
Addition & Subtraction	16	16	16
Multiplication & Division	16	16	16
Extraction of square root	16	—	16

Types of Calculation :

Addition, subtraction, multiplication and division. Chain multiplication and division. Multiplication and division by a constant. Sum and difference of products or quotients. Involution. Percentage calculation. Extraction of square root. Various mixed calculations.

Negative Numbers :

True value indication with a minus sign.

Decimal Point Setting :



Can be designated at any of 0, 1, 2, 3, 4, 5, 6, 7, 8, 10, 12 digits and F position.

Position	Entry	Calculation	Result
0, 2, 3, 4, 5, 6, 7, 8, 10, 12	floating	floating	designated
F position	floating	floating	floating

Indication Functions :

- Zero-suppressed indication panel
- Punctuation at every 3 digits
- Memory Lamps

Automatic Functions :

-  key for constant calculations
-  key for sum and difference of products or quotients
- "Sum Operand" function
- Automatic rounding off, rounding up

and dropping off of results

- Item counter for counting calculations

Safety Devices :

- Interlock device when numerical overflow occurs
- Electronic double entry prevention and interlock device
- Automatic clearing circuit for immediate use

Elements :

7 LSIs, transistors and diodes

Power Source :

AC100/115 v (-15% +10%) 50/50 Hz 16w

AC220/240 v (-15% +10%) 50/60 Hz 16w

Usable Temperature :

0°C-40°C (32°F-104°F)

Size :

286mm wide x 308mm deep x 94mm high
(11-1/4" x 12-1/8" x 3-3/4")

Weight :

3.9 kg (8.6 lbs)

Subject to alterations.



0 0



KEYS AND CONTROLS

ON Power switch OFF

Power flows when this is turned ON, and all circuits are automatically cleared.

0-9 Numerical keys

Digits are entered by pressing the desired keys. If two keys are pressed simultaneously, the double entry device operates and the overflow lamp lights, preventing further entries. Correct with the \leftarrow key.

□ Decimal point key

Completely automatic decimal point system. Press this key at the desired position when entering digits. When entering decimal digits only, it is not necessary to press the \square key before entering the decimal point.

Example : 0.1234

Operation : \square 1 2 3 4

If the decimal point is entered in the wrong position, simply enter it once more in the

correct position. Correction is automatic.
Example : 123.4

Operation : 1 2 \square 3 \square 4

\pm Plus-equal key

Press this key to obtain the result of additions, multiplications, divisions, product sums and quotient sums. When the \pm key is locked, results of multiplications and divisions are added to the memory.

\mp Minus-equal key

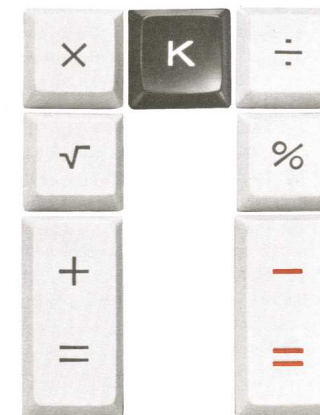
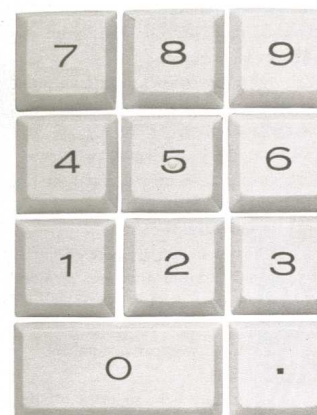
Press this key to obtain the results of subtractions, product differences and quotient differences. Also pressed when entering a negative number. When the \mp key is locked, the results of multiplications and divisions are subtracted from the memory.

\times Multiplication key

Press this key after entering the multiplicand in multiplications.

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Canon Canola L 163



\div Division key

Press this key after entering the dividend in divisions.

\mathbf{K} Constant key

A lock key for performing constant multiplication and division. Lock the \mathbf{K} key and perform the first calculation in the usual way ; subsequent constant multiplication and division can be performed simply by pressing the \pm key. The multiplicand becomes the constant in multiplication, and the divisor becomes the constant in division.

To unlock the \mathbf{K} key, press it once more. This key is also used in involutions : the n th power of a number is obtained by pressing the \pm key ($n - 1$) times. Thus, $x \times \pm \pm$ gives x^5 .

\rightarrow Shift key

This key is used to shift displayed numerals one digit in the direction of the arrow.

(Decimal point stops at 0 position.) Use it in the following cases :

1. To correct a wrongly registered figure. For example, if 233 has been mistakenly entered as 232, press the \leftarrow key and re-enter 3.
2. After double entry. To resume registration of numerals, drop off one digit with the \leftarrow key and re-enter.
3. When you wish to continue calculation with an overflowed number. Drop off the desired number of digits with this key.

\mathbf{AM} Accumulation key

An automatic accumulation key used in calculating sums and differences of products and quotients. This key locks when pressed ; to release it, press it once more. When this key is locked, results or displayed figures are added to or subtracted from the memory when the \pm or \mp key is pressed.

Reverse key

This key is used to interchange the multiplicand and multiplier in multiplications and the dividend and divisor in divisions.

Clear indicator key

Clears displayed numerals. Used to correct all registered digits.

Clear key

Clears all registers except the memories.

Clear memory 1 key

Clears the contents of the first memory.

Clear memory 2 key

Clears the contents of the second memory.

Recall memory 1 key

Recalls the contents of the first memory.

Recall memory 2 key

Recalls the contents of the second memory.

Minus memory 2 key

Used to subtract displayed figures from the second memory.

Plus memory 2 key

Used to add displayed figures to the second memory.

Root key

Press this key to obtain square roots.

Percentage key

Used in percentage calculations :

If this key is pressed after the multiplier, the result is automatically divided by 100.

Example : 10,000 \times 30 % \div (3,000)

This key automatically divides a displayed figure by 100.

Round-off switch

A selector switch for rounding off, rounding up or dropping off of decimals.

Affects the decimal digit after the pre-selected number of decimal places. Set the switch to the left for rounding up, to the center for rounding off (fractions of 5 and above are counted as whole numbers, fractions of 4 and below are disregarded), and to the right for dropping off.



Decimal point selector

Preselects the number of decimal digits. Settings are 0, 1, 2, 3, 4, 5, 6, 7, 8, 10, 12 and F (floating).

Overflow lamp

The overflow lamp lights in the following

cases, preventing further operation :

1. When entered figure overflows. Lights when the 17th digit is entered. To resume calculations, press the  key.
2. When two keys are pressed simultaneously by mistake. To resume calculations, drop off one digit with the  key and re-enter.
3. When result overflows. Lights when the number of integral digits in the result exceeds 16.
4. When memory overflows. Lights when the number of integral digits in the memory exceeds 16.

Memory lamps

These light when figures are entered in the memories and indicate that the memory concerned is in use.



Minus sign

This lights to indicate negative numbers.

3-digit markers

These automatically light to mark off displayed figures into groups of 3 digits, starting from the decimal point.

Item counter

Automatically counts the number of calculations performed (the number of times the  and  keys are pressed). Returns to zero when the reset button is pressed.

SUM M2 switch













Set to M2 for normal memory calculations. For automatic accumulation of figures being calculated, set to SUM OPD.

PRECAUTIONS IN OPERATION

Pressing of Keys


Press the keys accurately. If two keys are pressed simultaneously, the overflow lamp lights.

Key Operation

For right hand operation, place the index finger on key , the middle finger on key  and the third finger on key . Make a habit of keeping your fingers in these positions. Thus, press the left column keys    with the index finger, the middle column keys    with the middle finger, and the right column keys    with the third finger. With practice, blind operation will soon become possible.



Notes :


- 1) Always press the  key after random operation.
- 2) Remove the cover during operation, and take care not to block the ventilation holes at the top and bottom of the calculator.
- 3) Do not use the calculator in direct sunlight.


In the examples that follow, the following symbols will be used :


- 1) Decimal point selector :




\odot \odot \odot The figures indicate the decimal point setting.



- 2) Round-off switch :

 Rounding up

 Rounding off

 Dropping off

- 3)   switch:  Sum operand

Thus, the symbols \odot   indicate that, for the calculation concerned, the decimal point selector is set at 2, the round-off switch at dropping off and the memory 2 switch at sum operand.

CALCULATION

1. Addition and Subtraction, Multiplication, and Division

1-1 Addition and Subtraction

Calculation example	Setting	Key operation	Display
1) $123 + 456 = 579$	$\cdot(4) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 123 2 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 3 456 4 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$	123. 123.0000 456. 579.0000
2) $456 - 123 = 333$	$\cdot(4) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 456 2 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 3 123 4 $\begin{array}{ c } \hline - \\ \hline \end{array}$	456. 456.0000 123. 333.0000
3) $12.34 + 1.5 + 8.765 - 4.91 = 17.695$	$\cdot(3) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 12.34 2 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 3 1.5 4 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 5 8.765 6 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 7 4.91 8 $\begin{array}{ c } \hline - \\ \hline \end{array}$	12.34 12.340 1.5 13.840 8.765 22.605 4.91 17.695
4) $12.34 - 25 = -12.66$	$\cdot(2) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 12.34 2 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$ 3 25 4 $\begin{array}{ c } \hline - \\ \hline \end{array}$	12.34 12.34 25. 12.66

- (1) Before starting an addition or subtraction, press the $\begin{array}{|c|} \hline \pm \\ \hline \end{array}$ key.
- (2) Simply enter the numerals and the decimal point in their natural order. Positioning is automatic.
- (3) The minus sign lights up to indicate that the displayed figure is a negative number.
- (4) Set the decimal point selector according to the contents of the calculation.
- (5) Decimal digits in excess of the setting may be entered but will be dropped off (regardless of the setting of the round-off switch) when the $\begin{array}{|c|} \hline \pm \\ \hline \end{array}$ or $\begin{array}{|c|} \hline - \\ \hline \end{array}$ keys are pressed.

1-2 Multiplication

Calculation example	Setting	Key operation	Display
1) (Simple Multiplication) $123 \times 456 = 56,088$	$\cdot(0) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 123 2 $\begin{array}{ c } \hline \times \\ \hline \end{array}$ 3 456 4 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$	123. 123. 456. 56,088.

- (1) The multiplicand remains displayed when the $\begin{array}{|c|} \hline \times \\ \hline \end{array}$ key is pressed. When the multiplier is entered, the multiplicand disappears and only the multiplier is displayed. If the $\begin{array}{|c|} \hline \text{rv} \\ \hline \end{array}$ key is now pressed, the multiplicand is recalled. Pressing the $\begin{array}{|c|} \hline \text{rv} \\ \hline \end{array}$ key once more recalls the multiplier. This permits figures to be checked after entering.
- (2) Clearing after multiplication and division is automatic. It is not necessary to press the $\begin{array}{|c|} \hline \square \\ \hline \end{array}$ key after each calculation.
- (3) The overflow lamp does not light even though the number of integral digits in the result exceeds 16—decimal point preselected digit). If this exceeds 16, however, the overflow lamp lights and excess digits at the right are dropped according to the leftmost digit priority system. Both multiplications and divisions can be continued if the $\begin{array}{|c|} \hline \pm \\ \hline \end{array}$ key is pressed.
- (4) If the $\begin{array}{|c|} \hline \times \\ \hline \end{array}$ key is pressed by mistake instead of the $\begin{array}{|c|} \hline \div \\ \hline \end{array}$ key, simply press the $\begin{array}{|c|} \hline \times \\ \hline \end{array}$ key after it. Calculation can be continued as normal.

Calculation example	Setting	Key operation	Display
2) (Negative Multiplication with Decimal) $-1.2 \times (-3.45) = 4.14$	$\cdot(4) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 1.2 2 $\begin{array}{ c } \hline - \\ \hline \end{array}$ 3 $\begin{array}{ c } \hline \times \\ \hline \end{array}$ 4 3.45 5 $\begin{array}{ c } \hline - \\ \hline \end{array}$	1.2 1.2000 1.2000 3.45 4.1400

- (1) The $\begin{array}{|c|} \hline - \\ \hline \end{array}$ key is used to enter a negative number.

Calculation example	Setting	Key operation	Display
3) (Multiplication with Round-Off) $123.456 \times 789.789 = 97,504.1908$	$\cdot(4) \begin{array}{ c } \hline \text{L 5/4} \\ \hline 0 \end{array}$	1 123.456 2 $\begin{array}{ c } \hline \times \\ \hline \end{array}$ 3 789.789 4 $\begin{array}{ c } \hline \pm \\ \hline \end{array}$	123.456 123.456 789.789 97,504.1908

- (1) With settings at $\cdot(4)$ and $\begin{array}{|c|} \hline \text{L 5/4} \\ \hline 0 \end{array}$, the result is obtained to four decimal places, with rounding off of the fifth decimal digit.
- (2) With settings at $\cdot(4)$ and $\begin{array}{|c|} \hline \text{L 5/4} \\ \hline 0 \end{array}$, the fifth decimal digit is dropped off and the result becomes 97504.1907. With the round-off switch set at $\begin{array}{|c|} \hline \text{L 5/4} \\ \hline 0 \end{array}$ rounding up occurs and the result is the same as in 3).

Calculation example	Setting	Key operation	Display
4) (Chain Multiplication) $123.456 \times 789.456 \times 456.123$ $= 44,455,152.4096$	$\cdot 4 \cdot \frac{123.456}{0}$	1 123.456	123.456
		2 \times	123.456
		3 789.456	789.456
		4 \times	97,463.079936
		5 456.123	456.123
		6 $=$	44,455,152.4096

- (1) Key operation in chain multiplication follows the natural order. There is no need to press the $\frac{\pm}{\pm}$ key to obtain intermediate results.
- (2) Pressing the \times key gives intermediate results. The position of the decimal point in such results is floating, and is not limited by the setting of the decimal point selector. This results in greater accuracy in the final result.
- (3) The setting of the decimal point selector affects only the final result. At entry and in intermediate results, the position of the decimal point is floating, and figures with more than the designated number of decimal digits can be registered as they stand.
- (4) If the number of digits in the result exceeds 16, the leftmost digit priority system functions and excess digits at the right are dropped. If the number of integral digits exceeds 16, the position of the decimal point automatically indicates the number of integral digits that have been dropped. (For instance, if 3 integral digits are dropped, the decimal point appears after the third digit from the left.) In this case, the overflow lamp lights, but the actual position of the decimal point is preserved inside the registers.

Calculation example	Setting	Key operation	Display
5) (Floating Calculation) $12.345 \times 789.456 = 9745.83432$	$\cdot F \cdot$	1 12.345	12.345
		2 \times	12.345
		3 789.456	789.456
		4 $=$	9745.83432

- (1) If the decimal point selector is set at F, all effective digits within the capacity of the indicator are displayed.

1-3 Division

Calculation example	Setting	Key operation	Display
1) (Simple Division) $456 \div 123 = 3.707317$	$\cdot 6 \cdot \frac{123.456}{0}$	1 456	456.
		2 \div	456.
		3 123	123.
		4 $=$	3.707317

- (1) The dividend remains displayed when the \div key is pressed. When the divisor is entered, the dividend disappears and only the divisor is displayed. If the mv key is now pressed, the dividend is recalled. Pressing the mv key once more recalls the divisor. This permits checking of figures after registering.
- (2) The dividend and divisor can both be entered up to 16 digits.
- (3) The overflow lamp does not light even though the number of integral digits in the result exceeds (16—decimal point preselected digit). If this exceeds 16, however, the overflow lamp lights and excess digits at the right are dropped according to the leftmost digit priority system. Both multiplications and divisions can be continued if the $\frac{\pm}{\pm}$ key is pressed.
- (4) If the \times key is pressed by mistake instead of the \div key, simply press the \div key after it. Calculations can be continued as normal.
- (5) Rounding off, rounding up and dropping off of decimals at the preselected decimal digit are carried out in the same way as for multiplication.

Calculation example	Setting	Key operation	Display
2) (Chain Division) $123,456,789 \div 456.123 \div 789.456 = 342.850727$	$\cdot 6 \cdot \frac{123.456}{0}$	1 123456789	123,456,789.
		2 \div	123,456,789.
		3 456.123	456.123
		4 \div	270,665.5638939496
		5 789.456	789.456
		6 $=$	342.850727

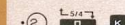




- (1) Key operation in chain division follows the natural order.
- (2) The position of the decimal point in intermediate results is floating, and is not limited by the setting of the decimal point selector.

1-4 Mixed Calculation

Calculation example	Setting	Key operation	Display
(268 + 283) \times 1.28 \div 12 = 58.77	$\cdot 2 \cdot \frac{123.456}{0}$	1 268	268.
		2 $+$	268.00
		3 283	283.
		4 $+$	551.00
		5 \times	551.00
		6 1.28	1.28
		7 \times	705.28
		8 12	12.
		9 \div	58.77


2. Constant Multiplication and Division

2-1 Constant Multiplication

Calculation example	Setting	Key operation	Display
$359.42 \times 2,145 = 770,955.90$ $349.42 \times 4,950.6 = 1,779,344.65$ $359.42 \times 3,784.38 = 1,360,181.86$		1 359.42	359.42
		2 	359.42
		3 2145	2,145.
		4 	770,955.90
		5 4950.6	4,950.6
		6 	1,779,344.65
		7 3784.38	3,784.38
		8 	1,360,181.86
For longer calculations, repeat as in steps 7 and 8.			

- (1) In multiplication, the first figure entered after the \times key is locked (i.e. the multiplicand) becomes the constant. Subsequent calculation is automatic.

2-2 Constant Division

Calculation example	Setting	Key operation	Display
$31,750 \div 360 = 88.1944$ $54,236 \div 360 = 150.6556$ $876.12 \div 360 = 2.4337$		1 31750	31,750.
		2 \div	31,750.
		3 360	360.
		4 \pm	88.1944
		5 54236	54,236.
		6 \pm	150.6556
		7 876.12	876.12
		8 \pm	2.4337
For longer calculations, repeat as in steps 7 and 8.			

- (1) In division, the second figure entered after the \div key is locked (i.e. the divisor) is memorized as the constant. Subsequent calculation is automatic.
- (2) For chain multiplications and divisions with constants, the second memory must be used.
- In case of an intermediate change in the decimal point setting, the content of the memory is calculated with the initial decimals, independent of the new setting for the results.
- This function ensures high accuracy of results.

3. Involution, Extraction of Square Root and Percentage Calculations

3-1 Involution

Calculation example	Setting	Key operation	Display
1) (Squaring a Number) $3.14159^2 = 9.869588$		1 3.14159	3.14159
		2 \times	3.14159
		3 \pm	9.869588
2) (Raising to n Powers) $3^8 = 6,561$		1 3	3.
		2 \times	3.
		3 \pm	9.
		4 \pm	27.
		5 \pm	81.
		6 \pm	243.
		7 \pm	729.
		8 \pm	2,187.
		9 \pm	6,561.

- (1) The following method can also be used for squaring and raising to the 4th and 8th power :
- 3 \times \pm (square) \times \pm (4th power) \times \pm (8th power)






















3-2 Extraction of Square Root



Calculation example	Setting	Key operation	Display
$\sqrt{2} = 1.414213562373095$		1 2	2.
		2 $\sqrt{}$	1.414213562373095

- (1) When the decimal point selector is set at F, all 16 effective digits are displayed.
- (2) When the decimal point selector is set at other positions, the result is obtained to the designated number of decimal places.
- (3) The item counter does not advance when the $\sqrt{}$ key is pressed.






4. Calculations Using the Memories














3-3 Percentage Calculation





Calculation example	Setting	Key operation	Display
1) (Simple Percentage) $1,000 \times 28\% = 280.0$ $2,350 \times 17\% = 399.5$ $368 \times 58\% = 213.4$	(1)  	1 1000 2  3 28 4  5  6 2350 7  8 17 9  10  11 368 12  13 58 14  15 	1,000. 1,000. 28. 0.28 280.0 2,350. 2,350. 17. 0.17 399.5 368. 368. 58. 0.58 213.4
2) (Percentage Calculation with a Constant) $256 \times 20\% = 51$ $256 \times 38\% = 97$ $256 \times 42\% = 108$ Total 256	(2)    	1 256 2  3  4 20 5  6 38 7  8 42 9  10 	256. 2.56 2.56 20. 51. 38. 97. 42. 108. 256.

- (1) Pressing the  key, registering the number and pressing the  key before starting the actual calculation results in the constant being divided by 100.

4-1 Calculations Using First Memory

When the  key is locked and the  or  key is pressed, the result is automatically added to or subtracted from the first memory. To recall the contents of this memory, press the  key; to erase the contents, press the  key.

Calculation example	Setting	Key operation	Display
1) (Sum of Products of Chain Multiplication) $243 \times 18 \times 0.86 = 3761.64$ $576 \times 32 \times 0.78 = 14,376.96$ $387 \times 29 \times 0.88 = 9,876.24$ Total 28,014.84	(2)   	1 243 2  3 18 4  5 .86 6  7 576 8  9 32 10  11 .78 12  13 387 14  15 29 16  17 .88 18  19 	243. 243. 18. 4,374. 0.86 3,761.64 576. 576. 32. 18,432. 0.78 14,376.96 387. 387. 29. 11,223 0.88 9,876.24 28,014.84

- (1) When calculating the difference of products, press the  key instead of the  key.
- (2) Figures are added to the first memory only when the  key is pressed. Pressing the  key between steps 3 and 4 by mistake would result in the intermediate product being added to the memory.
- (3) The position of the decimal point in figures entered in the memory corresponds to the setting of the decimal point selector when they are entered, regardless of the subsequent resetting of the decimal point selector.

Calculation example	Setting	Key operation	Display
2) (Sum of Products of Constant Multiplication) $0.85 \times 123 = 104.55$ $0.85 \times 456 = 387.60$ $0.85 \times 789 = 670.65$ <hr/> Total 1162.80		1 .85 2 \times 3 123 4 \pm 5 456 6 \pm 7 789 8 \pm 9 RM	0.85 0.85 123. 104.55 456. 387.60 789. 670.65 1,162.80
3) (Sum of Quotients of Chain Division) $3761.87 \div 0.86 \div 17 = 257$ $14,377.08 \div 0.78 \div 33 = 558$ <hr/> Total 815		1 3761.87 2 \div 3 .86 4 \div 5 17 6 \pm 7 14377.03 8 \div 9 .78 10 \div 11 33 12 \pm 13 RM	3,761.87 3,761.87 0.86 4,374.267441860465 17. 257. 14,377.03 14,377.03 0.78 18,432.08974358974 33. 558. 815.
4) (Sum of Quotients of Constant Division) $31,750 \div 360 = 88.1944$ $54,236 \div 360 = 150.6555$ $78,912 \div 360 = 219.2000$ <hr/> Total 458.0499		1 31750 2 \div 3 360 4 \pm 5 54236 6 \pm 7 78912 8 \pm 9 RM	31,750. 31,750. 360. 88.1944 54,236. 150.6555 78,912. 219.2000 458.0499

4-2 Calculations Using Second Memory

When the setting at , ordinary calculations using the Memory 2 can be made.
 When the switch set at , numerals to be calculated is automatically accumulated in the Memory 2.

Calculation example	Setting	Key operation	Display
1) (Sum of Products of Constant Multiplication) $1\$ = ¥360$ Quantity \$ ¥ $271 \times \$35.27 \times 358 = ¥3,421,824$ $123 \times \$25.32 \times 358 = ¥1,114,940$ <hr/> Total ¥4,536,764		1 271 2 \times 3 35.27 4 \times 5 RM 6 \pm 7 123 8 \times 9 25.32 10 \times 11 RM 12 \pm 13 RM	271. 271. 35.27 9,558.17 358. 3,421.824. 123. 123. 25.32 3,114.36 358. 1,114,940. 4,536,764.

- (1) When the RM key is pressed, the displayed figure is memorized as the constant in the second memory.
- (2) To recall the figure from the second memory, press the RM key. The recalled figure can be freely used for all calculations.
- (3) (2) also applies to the first memory, though of course the RM key is used.

Calculation example	Setting	Key operation	Display
2) (Subtotals and Grand Total of Products)		1 123	123.
		2 \times	123.
		3 45	45.
Quantity		4 \pm	5,535.
$123 \times 45 = 5,535$		5 456	456.
$456 \times 78 = 35,568$		6 \times	456.
Subtotal 41,103		7 78	78.
		8 \pm	35,568.
$789 \times 12 = 9,468$		9 RM	41,103.
$147 \times 25 = 3,675$		10 M	41,103.
Subtotal 13,143		11 CM	41,103.
Grand total 54,246		12 789	789.
		13 \times	789.
		14 12	12.
		15 \pm	9,468.
		16 147	147.
		17 \times	147.
		18 25	25.
		19 \pm	3,675.
		20 RM	13,143.
		21 M	13,143. ... Add to second memory
		22 RM	54,246. ... Recall grand total
3) (Calculation Using SUM OPERAND Function)		1 285	285.
$285 \times 141 = 40,185$		2 \times	285.
$387 \times 129 = 49,923$		3 141	141.
$486 \times 87 = 42,282$		4 \pm	40,185.
$632 \times 14 = 8,848$		5 387	387.
1,790 141,238.		6 \times	387.
		7 129	129.
		8 \pm	49,923.
		9 486	486.
		10 \times	486.
		11 87	87.
		12 \pm	42,282.
		13 632	632.
		14 \times	632.
		15 14	14.
		16 \pm	8,848.
		17 RM	1,790.
		18 RM	141,238.

Calculation example	Setting	Key operation	Display
4) (Average Unit Price Calculation)		1 123	123.
Quantity Unit price Amount (\$)		2 \times	123.
		3 98.7	98.7
$123 \times 98.70 = 12,140.10$		4 \pm	12,140.10
$36 \times 103.20 = 3,715.20$		5 36	36.
$85 \times 101.50 = 8,627.50$		6 \times	36.
244 24,482.80		7 103.2	103.2
		8 \pm	3,715.20
		9 85	85.
Formula: Average unit price		10 \times	85.
= Total amount \div Quantity		11 101.5	101.5
= 100.34		12 \pm	8,627.50
		13 SUM/DPC/M2	8,627.50
		14 RM	24,482.80
		15 \pm	24,482.80
		16 RM	244.00
		17 \pm	100.34

(1) At the 13th step, it is required to change the SUM/DPC/M2 switch to M2, in order to avoid the total amount in the 1st memory to be automatically added in the 2nd memory at the 15th step.

5. Applied Calculations

Calculation example	Setting	Key operation	Display
1) (Composite Ratio Calculation)		1 3524500	3,524,500.
		2 $\frac{\square}{\square}$	3,524,500.00
Obtaining the sales percentage of each store against total sales :	\odot $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$	3 5163200	5,163,200.
		4 $\frac{\square}{\square}$	8,687,700.00
		5 4048600	4,048,600.
		6 $\frac{\square}{\square}$	12,736,300.00
		7 2975800	2,975,800.
		8 $\frac{\square}{\square}$	15,712,100.00 Total sales
		9 $\frac{\square}{\square}$	15,712,100.00 . . . To obtain total
		11 $\frac{\square}{\square}$	15,712,100.00
		12 3524500	3,524,500.
		13 $\frac{\square}{\square}$	15,712,100. . . Interchanging denominator and numerator
		14 $\frac{\square}{\square}$	157,121.00.
		15 $\frac{\square}{\square}$	22.43
		16 5163200	5,163,200.
		17 $\frac{\square}{\square}$	32.86
		18 4048600	4,048,600.
		19 $\frac{\square}{\square}$	25.77
		20 2975800	2,975,800.
		21 $\frac{\square}{\square}$	18.94
		22 $\frac{\square}{\square}$	100.00

Store	Sales (\$)	%
A	3,524,500	(22.43)
B	5,163,200	(32.86)
C	4,048,600	(25.77)
D	2,975,800	(18.94)
Total	(15,712,100)	(100.00)

$$\text{Formula: } \frac{\text{Sales of each store}}{\text{Total sales}} \times 100$$

$$= \frac{\text{Sales of each store}}{15,712,100} \times 100$$

- (1) In certain calculations, the figure recalled at the end by the $\frac{\square}{\square}$ key may not be 100.00. This is due to the rounding off of decimals and should be corrected as necessary.
- (2) The $\frac{\square}{\square}$ key can be pressed anywhere before step 15.

Calculation example	Setting	Key operation	Display
2) (Proportional Allotment Calculation)		1 1985	1,985.
		2 $\frac{\square}{\square}$	1,985.
Distributing a total budget of \$1,583,000 among 4 stores according to their sales records:	\odot $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$	3 4623	4,623.
		4 $\frac{\square}{\square}$	6,608.
		5 2748	2,748.
		6 $\frac{\square}{\square}$	9,356.
		7 6136	6,136.
		8 $\frac{\square}{\square}$	15,492.
		9 $\frac{\square}{\square}$	15,492.
		10 1583	1,583.
		11 $\frac{\square}{\square}$	15,492 . . . Interchanging denominator and numerator
		12 $\frac{\square}{\square}$	0.102181771236767
		13 $\frac{\square}{\square}$	0.102181771236767
		14 1985	1,985.
		15 $\frac{\square}{\square}$	203.
		16 4623	4,623.
		17 $\frac{\square}{\square}$	472.
		18 2748	2,748.
		19 $\frac{\square}{\square}$	281.
		20 6136	6,136.
		21 $\frac{\square}{\square}$	627.
		22 $\frac{\square}{\square}$	1,583.

Store	Sales(Unit: \$1,000)	Budget(Unit: \$1,000)
A	1,985	(203)
B	4,623	(472)
C	2,748	(281)
D	6,136	(627)
Total	(15,492)	1,583

$$\text{Formula: } \frac{1,583}{15,492} \times \text{Sales of each store}$$

Explanation of $\frac{\square}{\square}$ Key

The $\frac{\square}{\square}$ key interchanges the multiplicand and the multiplier in multiplications and the dividend and the divisor in divisions, and is used in percentage and ratio calculations.

For example, when finding the total and then obtaining the percentage for each item, it is normally necessary to clear the contents of the calculator and then calculate $\text{dividend} \div \text{divisor} \times 100$, since the total becomes the divisor. Since the $\frac{\square}{\square}$ key interchanges the dividend and the divisor, however, the total can be left as it is, without clearing, and the dividend registered as the divisor; then all that is needed is to press the $\frac{\square}{\square}$ key to reverse the two figures. If the $\frac{\square}{\square}$ key is now pressed, the divisor is memorized as a constant and

the percentages can be calculated simply by pressing the $\frac{\square}{\square}$ key. Thereafter, composition ratios can be obtained by repeatedly entering the various figures and pressing the $\frac{\square}{\square}$ key.

The $\frac{\square}{\square}$ key can also be used for checking registered figures in multiplications and divisions, especially multiplicands and dividends. These can be recalled by pressing the $\frac{\square}{\square}$ key once; pressing it once more returns the figures to their original position. In addition and subtraction, $\frac{\square}{\square}$ key recalls the numeral to be calculated.














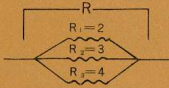
















For example : $a + b + b = d$




Operation : $a \frac{\square}{\square} b \frac{\square}{\square} \frac{\square}{\square} \frac{\square}{\square}$

This function saves the repetition of the same entry, shortening the whole operation. Even when c is wrongly entered instead of b and the $\frac{\square}{\square}$ is pressed, the correction can be easily made as $\frac{\square}{\square} \frac{\square}{\square} c \frac{\square}{\square}$.

Calculation example				Setting	Key operation	Display
5) (Depreciation Calculation)					1 350000	350,000. . . Acquisition cost
Fifth year depreciation					2 $\frac{\square}{\square}$	350,000.
Year	Cost of acquisition	Depreciation	Book value		3 \times	350,000.
1	350,000	(129,150)	(220,850)		4 .369	0.369
2		(81,494)	(139,356)		5 $=$	350,000.
3		(51,422)	(87,934)		6 $=$	129,150. — . . . First year depreciation
4		(32,448)	(55,486)		7 $=$	220,850. . . . First year book value
5		(20,474)	(35,012)		8 $=$	81,494. — . . . Second year depreciation
					9 $=$	139,356. . . . Second year book value
Rate of depreciation					10 $=$	51,422. — . . . Third year depreciation
Durable years	One business year	One business half-year			11 $=$	87,934. . . . Third year book value
2	.684	.438			12 $=$	32,448. — . . . Fourth year depreciation
3	.536	.319			13 $=$	55,486. . . . Fourth year book value
4	.438	.250			14 $=$	20,474. — . . . Fifth year depreciation
5	.369	.206			15 $=$	35,012. . . . Fifth year book value
6	.319	.175				
7	.280	.152				
8	.250	.134				
9	.226	.120				
10	.206	.109				

Calculation example			Setting	Key operation	Display
6) (Standard Deviation Calculation)				1 25.285	25.285
				2 \times	25.285
				3 \pm	639.3312
				4 24.974	24.974
				5 \times	24.974
				6 \pm	623.7007
				7 25.156	25.156
				8 \times	25.456
				9 \pm	632.8243
				10 25.028	25.028
				11 \times	25.028
				12 \pm	626.4008
				13 24.897	24.897
				14 \times	24.867
				15 \pm	619.8606
				16 $\overline{\text{AM}}$ (Release)	619.8606
				17 $\overline{\text{FM}}$	125.3400 ... Σx_i
				18 \div	125.3400
				19 5	5.
				20 \pm	25.0680 ... Mean Value : \bar{x}
				21 \times	25.0680
				22 \pm	628.4046 ... \bar{x}^2
				23 \times	628.4046
				24 5	5.
				25 \pm	3142.0230 ... $-n\bar{x}^2$
				26 $\overline{\text{FM}}$	3142.1176 ... Σx_i^2
				27 \pm	0.0946 ... $\Sigma x_i^2 - n\bar{x}^2$
				28 \div	0.0946
				29 5	5.
				30 \pm	0.0189 ... Variance : s^2
				31 $\sqrt{}$	0.1374 ... Standard deviation : s

Calculation example	Setting	Key operation	Display
7) (Calculation of Automobile's Braking Distance)		1 40	40.
Finding the distance travelled by an automobile after the brakes are first applied until it stops completely:	$\cdot 4$  	2 	40.
Formula:		3 5	5.
$X = \left(\frac{5}{18} V \right)^2 \times \frac{1}{19.6 \mu}$		4 	200.
X = Braking distance		5 18	18.
V = Speed of automobile		6 	11.111111111111
μ = Friction coefficient of tires and road surface		7 	11.111111111111
Finding X when V = 40km and $\mu = 0.4$		8 	123.4568
		9 	123.4568
		10 19.6	19.6
		11 	6.298816326530612
		12 .4	0.4
		13 	15.7470
8) (Total Resistance of a Parallel Circuit)	$\cdot 5$   	1 2	2.
		2 	2.
$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = 0.92308$		3 	1.00000
		4 	0.50000
		5 	0.50000
		6 3	3.
		7 	3.
		8 	1.00000
		9 	0.33333
		10 	0.33333
		11 4	4.
		12 	4.
		13 	1.00000
		14 	0.25000
		15 	0.25000
		16 	1.08333
		17 	1.08333
		18 	1.00000
		19 	0.92308

- (1) By pressing  , the displayed figure a is divided by itself ($a \div a = 1$). Pressing the  key once more automatically results in a reciprocal calculation of $1 \div a = \frac{1}{a}$.

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