

SHARP

ENGLISH

SCIENTIFIC CALCULATOR

EL-531TG
MODEL EL-531TH

OPERATION MANUAL

INTRODUCTION

Thank you for purchasing the SHARP Scientific Calculator Model EL-531TG/TH. After reading this manual, store it in a convenient location for future reference.

Note:

- On the sheet with calculation examples is used english notation (with a decimal point).
- This product uses a period as a decimal point.

Operational Notes

- Do not carry the calculator around in your back pocket, as it may break when you sit down. The display is made of glass and is particularly fragile.
- Keep the calculator away from extreme heat such as on a car dashboard or near a heater, and avoid exposing it to excessively humid or dusty environments.
- Since this product is not waterproof, do not use it or store it where fluids, for example water, can splash onto it. Raindrops, water spray, juice, coffee, steam, perspiration, etc. will also cause malfunction.
- Clean with a soft, dry cloth. Do not use solvents or a wet cloth.
- Do not drop it or apply excessive force.
- Never dispose of batteries in a fire.
- Keep batteries out of the reach of children.
- For the sake of your health, try not to use this product for long periods of time. If you need to use the product for an extended period, be sure to allow your eyes, hands, arms, and body adequate rest periods (about 10–15 minutes every hour).
- If you experience any pain or fatigue while using this product, discontinue use immediately. If the discomfort continues, please consult a doctor.
- This product, including accessories, may change due to upgrading without prior notice.

NOTICE

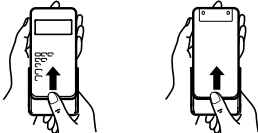
- SHARP strongly recommends that separate permanent written records be kept of all important data. Data may be lost or altered in virtually any electronic memory product under certain circumstances. Therefore, SHARP assumes no responsibility for data loss or otherwise rendered unusable whether as a result of improper use, repairs, defects, battery replacement, use after the specified battery life has expired, or any other cause.
- 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 back), with the tip of a ball-point pen or similar object, only in the following cases:
 - When using for the first time
 - After replacing the battery
 - To clear all memory contents
 - When an abnormal condition occurs and all keys are inoperative.

Do not use an object with a breakable or sharp tip. Note that pressing the RESET switch erases all data stored in memory.

If service should be required on this calculator, use only a SHARP servicing dealer, SHARP approved service facility, or SHARP repair service where available.

Hard Case



DISPLAY



- During actual use, not all symbols are displayed at the same time.
- Certain inactive symbols may appear visible when viewed from a far off angle.
- Only the symbols required for the usage currently being explained are shown in the display and calculation examples in this manual.

- ←/→**: Appears when the entire equation cannot be displayed. Press **◀**/**▶** to see the remaining (hidden) section.
- ▲/▼**: Indicates that data can be visible above/below the screen. Press **▲** / **▼** to scroll up/down the view.
- 2ndF**: Appears when **2ndF** is pressed, indicating that the functions shown in same color are enabled.
- HYP**: Indicates that **hYP** has been pressed and the hyperbolic functions are enabled. If **2ndF** **REC/HYP** are pressed, the symbols **2ndF HYP** appear, indicating that inverse hyperbolic functions are enabled.
- ALPHA**: Indicates that **ALPHA**, **STO** or **RCL** has been pressed, and entry (recall) of memory contents and recall of statistics can be performed.
- FIX / SCI / ENG**: Indicates the notation used to display a value.
- DEG / RAD / GRAD**: Indicates angular units and changes each time **DRG** is pressed.
- STAT**: Appears when statistics mode is selected.
- M**: Indicates that a value is stored in the independent memory.

BEFORE USING THE CALCULATOR

Key Notation Used in this Manual

e^x	F	To specify e^x	: 2ndF e^x
In		To specify ln	: In
		To specify F	: ALPHA F

- Functions that are printed in orange above the key require **2ndF** to be pressed first before the key. When you specify the memory, press **ALPHA** first. Numbers for input value are not shown as keys, but as ordinary numbers.

Power On and Off

Press **ON/C** to turn the calculator on, and **2ndF** **OFF** to turn it off.

Clearing the Entry and Memories

Operation	Entry (Display)	M ¹	A – F, X, Y ² ANS ³	STAT ⁴ STAT VAR ⁵
ON/C	○	x	x	x
2ndF CA	○	x	○	○
2ndF M-CL 0 0 ⁶	○	○	○	○
2ndF M-CL 1 0 ⁷	○	○	○	○
RESET switch	○	○	○	○

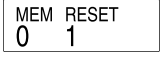
○: Clear x: Retain

- *1 Independent memory M
 - *2 Temporary memory A – F, X and Y
 - *3 Last answer memory
 - *4 Statistical data (entered data)
 - *5 T, x, σx , n, Σx , Σx^2 , \overline{y} , sy, sy, Σy , Σy^2 , Σxy , r, a, b, c.
 - *6 All variables are cleared. See 'About the Memory clear key' for details.
 - *7 This key combination functions the same as the RESET switch.
- See 'About the Memory clear key' for details.

Memory clear key

Press **2ndF** **M-CL** to display the menu.

To clear all variables (M, A – F, X, Y, ANS, STAT VAR), press **0** **0** or **0** **ENT**.



- To RESET the calculator, press **1** **0** or **1** **ENT**. The RESET operation will erase all data stored in memory, and restore the calculator's default setting.

Entering and Correcting the Equation

Cursor keys

- Press **◀** or **▶** to move the cursor. You can also return to the equation after getting an answer by pressing **▶** (**◀**). See the next section for using the **▲** and **▼** keys.
- In the SET UP menu and other locations, use the **◀** or **▶** key to move the flashing cursor, then press **ENT** (**=**) key. If you need to scroll up/down the view, use the **▲** or **▼** key.

Insert mode and Overwrite mode in the Equation display

- Pressing **2ndF** **INS** switches between the two editing modes: insert mode (default); and overwrite mode. A triangular cursor indicates that an entry will be inserted at the cursor, while the rectangular cursor indicates to overwrite preexisting data as you make entries.
- To insert a number in the insert mode, move the cursor to the place immediately after where you wish to insert, then make a desired entry. In the overwrite mode, data under the cursor will be overwritten by the number you enter.
- The mode set will be retained until the next RESET operation.

Deletion key

- To delete a number/function, move the cursor to the number/function you wish to delete, then press **DEL**. If the cursor is located at the right end of an equation, the **DEL** key will function as a back space key.

Multi-line Playback function

- This calculator is equipped with a function to recall previous equations in the normal mode. Equations also include calculation ending instructions such as "=" and a maximum of 142 characters can be stored in memory. When the memory is full, stored equations are deleted in the order of the oldest first. Pressing **▲** will display the previous equation and the answer. Further pressing **▲** will display preceding equations (after returning to the previous equation, press **▼** to view equations in order). In addition, **2ndF** **▲** can be used to jump to the oldest equation.
- To edit an equation after recalling it, press **▶** (**◀**).
- To edit the displayed equation, press **▶** (**◀**) immediately after obtaining a calculation answer.
- The multi-line memory is cleared by the following operations: **2ndF** **CA**, **2ndF** **OFF** (including the Automatic Power Off feature), mode change, memory clear (**2ndF** **M-CL**), RESET, **2ndF** **MEMO**, **ALPHA** **RCL** **ANS**, memory calculation, chain calculation, angle unit conversion, coordinate conversion, N-base conversion, numerical value storage to the temporary memories and independent memory, and input/deletion of statistical data.

Priority Levels in Calculation

This calculator performs operations according to the following priority:

- Fractions (1/r4, etc.)
- Functions preceded by their argument (x⁻¹, x², n!, etc.)
- y^r, $\sqrt[n]{}$
- Implied multiplication of a memory value (2Y, etc.)
- Functions followed by their argument (sin, cos, etc.)
- Implied multiplication of a function (2sin30, etc.)
- nCr, nPr, \otimes x, \oplus y, \ominus AND \otimes OR, XNOR \otimes =, M+, M-, \Rightarrow M, \blacktriangleright DEG, \blacktriangleright RAD, \blacktriangleright GRAD, DATA, CD, $\rightarrow r\theta$, $\rightarrow xy$ and other calculation ending instructions

If parentheses are used, parenthesized calculations have precedence over any other calculations.

INITIAL SET UP

Mode Selection

Normal mode (NORMAL): **MODE** **0** (default)

Used to perform arithmetic operations and function calculations.

Statistics mode (STAT): **MODE** **1**

Used to perform statistical calculations.

When executing mode selection, temporary memories, statistical variables, statistical data and last answer memory will be cleared even when reselecting the same mode.

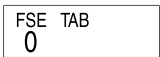
HOME Key

Press **HOME** to return to NORMAL mode from other modes.

Note: Equations and values currently being entered will disappear, in the same way as when the mode is changed.

SET UP menu

Press **SET UP** to display the SET UP menu.

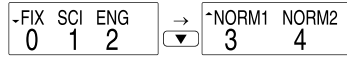


- A menu item can be selected by:
 - moving the flashing cursor by using **▶** **◀**, then pressing **ENT** (**=**) key, or
 - pressing the number key corresponding to the menu item number.
- If **▲** or **▼** is displayed on the screen, press **▲** or **▼** to view the previous/next menu screen.
- Press **ON/C** to exit the SET UP menu.

Selecting the Display Notation and Decimal Places

- Four display notation systems are used to display calculation results: Floating point; Fixed decimal point; Scientific notation; and Engineering notation.
- When the FIX, SCI, or ENG symbol is displayed, the number of decimal places (TAB) can be set to any value between 0 and 9. Displayed values will be reduced to the corresponding number of digits.
- If a floating point number does not fit in the specified range, the calculator will display the result using the scientific notation (exponential notation) system. See 'Setting the Floating Point Numbers System in Scientific Notation' for details.

- Press **SET UP**, followed by **0**, to display the following submenu:



Setting the Floating Point Numbers System in Scientific Notation

Two settings are used to display a floating point number: NORM1 (default setting) and NORM2. A number is automatically displayed in scientific notation outside a preset range:

- NORM1: $0.000000001 \leq x \leq 9999999999$
- NORM2: $0.01 \leq x \leq 9999999999$

100000÷3=	ON/C 100000 ÷ 3 =	33'333.33333
[Floating point (NORM1)]	SET UP 0 0	33'333.33333
→[Fixed decimal point]	SET UP 1 2	33'333.33
[TAB set to 2]	SET UP 0 1	3.33×10 ⁰⁴
→[Scientific notation]	SET UP 0 2	33.33×10 ⁰³
→[ENGINEERING notation]	SET UP 0 3	33'333.33333
→[Floating point (NORM1)]		

3÷100=	ON/C 100000 ÷ 3 =	0.003
[Floating point (NORM1)]	SET UP 0 4	3×10 ⁻⁰³
→[Floating point (NORM2)]	SET UP 0 3	0.003
→[Floating point (NORM1)]		

Determination of the Angular Unit

In this calculator, the following three angular units (degrees, radians, and grads) can be specified.



SCIENTIFIC CALCULATIONS

- Press **MODE** **0** to select the normal mode.
- In each example, press **ON/C** to clear the display. If the FIX, SCI, or ENG indicator is displayed, clear the indicator by selecting 'NORM1' from the SET UP menu.

Arithmetic Operations

- The closing parenthesis **)** just before **=** or **M+** may be omitted.

Constant Calculations

- In constant calculations, the addend becomes a constant. Subtraction and division are performed in the same manner. For multiplication, the multiplicand becomes a constant.
- In the constants calculations, constants will be displayed as K.

Functions

- Refer to the calculation examples of each function.
- Before starting calculations, specify the angular unit.

Random Function

The Random function has four settings for use in the normal or statistics mode. (This function cannot be selected while using the N-Base function.) Press **ON/C** to exit.

- The generated pseudo-random number series is stored in memory Y. Each random number is based on a number series.

Random Numbers

A pseudo-random number, with three significant digits from 0 up to 0.999, can be generated by pressing **2ndF** **RAN#** **0** **ENT**. To generate the next random number, press **ENT**.

Random Dice

To simulate a die-rolling, a random integer between 1 and 6 can be generated by pressing **2ndF** **RAN#** **1** **ENT**. To generate the next random number, press **ENT**.

Random Coin

To simulate a coin flip, 0 (head) or 1 (tail) can be randomly generated by pressing **2ndF** **RAN#** **2** **ENT**. To generate the next random coin number, press **ENT**.

Random Integer

An integer between 0 and 99 can be generated randomly by pressing **2ndF** **RAN#** **3** **ENT**. To generate the next random integer number, press **ENT**.

Angular Unit Conversions

Each time **2ndF** **DRG** are pressed, the angular unit changes in sequence.

Memory Calculations

This calculator has 8 temporary memories (A – F, X and Y) one independent memory (M) and one last answer memory (ANS). The independent memory and temporary memories are only available in the normal mode.

Temporary memories (A – F, X and Y)

Press **STO** and a variable key to store a value in memory.

Press **RCL** and a variable key to recall a value from the memory.

To place a variable in an equation, press **ALPHA** and a variable key.

Independent memory (M)

In addition to all the features of temporary memories, a value can be added to or subtracted from an existing memory value.

Press **ON/C** **STO** **M** to clear the independent memory (M).

Last answer memory (ANS)

The calculation result obtained by pressing **=** or any other calculation ending instruction is automatically stored in the last answer memory.

Note:

- Calculation results from the functions indicated below are automatically stored in memories X or Y. For this reason, when using these functions, be careful with the use of memories X and Y.
- Random function Y memory
- $\rightarrow r\theta$, $\rightarrow xy$ X memory (r or x), Y memory (θ or y)

- Temporary memories and last answer memory are cleared even when the same mode is reselected.
- Use of **RCL** or **ALPHA** will recall the value stored in memory using up to 14 digits.

Chain Calculations

- This calculator allows the previous calculation result to be used in the following calculation.
- The previous calculation result will not be recalled after entering multiple instructions.
- In the case of utilizing postfix functions ($\sqrt{}$, sin, etc.), you can perform a chain calculation even when the previous calculation result is cleared by the use of the **ON/C** key.

Fraction Calculations

- Arithmetic operations and memory calculations can be performed using fractions, and conversion between a decimal number and a fraction.
- If the number of digits to be displayed is greater than 10, the number is converted to and displayed as a decimal number.

CALCULATION EXAMPLES		
[1] ▲ ▼		
① 3(5+2)=	ON/C 3 (5 + 2) =	21.
② 3×5+2=	3 × 5 + 2 =	17.
③ 3×5+3×2=	3 × 5 + 3 × 2 =	21.
→ ①	2ndF ▲	21.
→ ②	▼	17.
→ ③	▼	21.
→ ②	▲	17.

[2] + − × ÷ () +/- Exp		
45+285÷3=	ON/C 45 + 285 ÷ 3 =	140.
18+6 =	(18 + 6) ÷	
15−8 =	(15 − 8) =	3.428571429
42×(−5)+120=	42 × (− 5 + 5 + 120 = *) (5 + − − − *)	−90.
(5×10³)÷(4×10 ^{−3})=	5 [Exp] 3 ÷ 4 [Exp] (+/- − 3 =)	1'250'000.

[3]		
34+57=	34 + 57 =	91.
45+57=	45 =	102.
79−59=	79 − 59 =	20.
56−59=	56 =	−3.
56÷8=	56 ÷ 8 =	7.
92÷8=	92 =	11.5
68×25=	68 × 25 =	1'700.
68×40=	40 =	2'720.

[4] sin cos tan sin^{−1} cos^{−1} tan^{−1} π DRG hyp arc hyp ln log e^x 10^x X^{−1} X² X³ √ y^x √^y √^y n! nPr nCr %		
sin60[°]=	ON/C sin 60 =	0.866025403
cos ^π ₄ [rad]=	DRG cos (π ÷ 4) =	0.707106781
tan ^{−1} 1=[g]	DRG 2ndF tan^{−1} 1 = DRG	50.
(cosh 1.5 + sinh 1.5) ² =	ON/C (hyp cos 1.5 + hyp sin 1.5) X² =	20.08553692
tanh ^{−1} ⁵ ₇ =	2ndF arc hyp tan (5 ÷ 7) =	0.895879734
ln 20 =	ln 20 =	2.995732274
log 50 =	log 50 =	1.698970004
e ³ =	2ndF e^x 3 =	20.08553692
10 ^{1.7} =	2ndF 10^x 1.7 =	50.11872336
1 + ¹ ₇ =	6 2ndF X^{−1} (7 2ndF X^{−1}) =	0.309523809
8 ^{−2} − 3 ⁴ × 5 ² =	8 (y^x + − 2 − 3 y^x × 5 X² =)	−2'024.984375
(12 ³) ^{¹₂} =	12 y^x 3 y^x 4 2ndF X^{−1} =	6.447419591
8 ³ =	8 (X³ =)	512.
√49 − ⁴ ₈₁ =	√ 49 − 4 2ndF √^y 81 =	4.
3√27 =	2ndF √^y 27 =	3.
4! =	4 2ndF n! =	24.
10P ₃ =	10 2ndF nPr 3 =	720.
5C ₂ =	5 2ndF nCr 2 =	10.
500×25%=	500 × 25 2ndF % =	125.
120÷400=?%	120 ÷ 400 2ndF % =	30.
500÷(500×25%)=	500 + 25 2ndF % =	625.
400−(400×30%)=	400 − 30 2ndF % =	280.

The range of the results of inverse trigonometric functions

	$\theta = \sin^{-1} x, \theta = \tan^{-1} x$	$\theta = \cos^{-1} x$
DEG	$-90 \leq \theta \leq 90$	$0 \leq \theta \leq 180$
RAD	$-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$	$0 \leq \theta \leq \pi$
GRAD	$-100 \leq \theta \leq 100$	$0 \leq \theta \leq 200$

[5] DRG ►		
90°→ [rad]	ON/C 90 2ndF DRG ►	1.570796327
→ [g]	2ndF DRG ►	100.
→ [°]	2ndF DRG ►	90.
sin ^{−1} 0.8 = [°]	2ndF sin^{−1} 0.8 =	53.13010235
→ [rad]	2ndF DRG ►	0.927295218
→ [g]	2ndF DRG ►	59.03344706
→ [°]	2ndF DRG ►	53.13010235

[6] ALPHA RCL STO M+ M− ANS		
A=56	ON/C 56 STO A	56.
B=68	68 STO B	68.
A÷2+B×4=	ALPHA A ÷ 2 + ALPHA B × 4 =	300.
24÷(8×2)=	ON/C 8 × 2 STO M	16.
(8×2)×5=	24 ÷ ALPHA M = ALPHA M × 5 =	1.5
	ALPHA M × 5 =	80.
	ON/C STO M	0.
\$150×3:M1	150 × 3 M+	450.
+) \$250:M2 =M1+250	250 M+	250.
→)M2×5%	RCL M × 5 2ndF % =	35.
M	2ndF M− RCL M =	665.
\$1= ¥110	110 STO Y	110.
¥26,510=\$?	26510 + RCL Y =	241.
\$2,750=¥?	2750 × RCL Y =	302'500.
r = 3cm	3 STO Y	3.
πr ² = ?	π ALPHA Y X² =	28.27433388
(r → Y)		
²⁴ ₄₊₆ = 2.4...(A)	24 ÷ (4 + 6) =	2.4
3×(A)+60÷(A)=	3 × ALPHA ANS + 60 ÷ ALPHA ANS =	32.2

[7]		
6+4=ANS	ON/C 6 + 4 =	10.
ANS+5	+ 5 =	15.
8×2=ANS	8 × 2 =	16.
ANS ²	X² =	256.
44+37=ANS	44 + 37 =	81.
√ANS=	√ =	9.

[8] a^bc d/c		
3 ^{¹₂} + ⁴ ₅ = [a ^b _c]	ON/C 3 a^bc 1 a^bc 2 + 4 a^bc 3 =	4 ⁴ ⁵ ⁶ +
→[a.xxx]	a^bc	4.833333333
→[d/c]	2ndF d/c	29 ⁷ ⁶
² ₁₀ ³ =	2ndF 10³ 2 a^bc 3 =	4.641588834
(⁷ ₅) ⁵ =	7 a^bc 5 y^x 5 =	16807 ³ ³¹²⁵
(¹ ₈) ^{¹₃} =	1 a^bc 8 y^x 1 a^bc 3 =	1 ⁷ ²
⁶⁴ _{√225} =	√ 64 a^bc 225 =	8 ⁷ ¹⁵
²³ _{3⁴} =	(2 y^x 3) a^bc (3 y^x 4) =	8 ⁷ ⁸¹
^{1.2} _{2.3} =	1.2 a^bc 2.3 =	12 ⁷ ²³
^{1'2"3"} ₂ =	1 DMS 2 DMS 3 a^bc 2 =	0°31'1.5"
^{1×10³} _{2×10³} =	1 Exp 3 a^bc 2 Exp 3 =	1 ⁷ ²
A = 7	ON/C 7 STO A	7.
⁴ _A =	4 a^bc ALPHA A =	4 ⁷ ⁷
1.25 + ² ₅ = [a.xxx]	1.25 + 2 a^bc 5 =	1.65
→[a ^b _c]	a^bc	1 ⁷ ¹³ ²⁰
1.65	ON/C 1.65 =	1.65
→[a ^b _c]	a^bc	1 ⁷ ¹³ ²⁰
→[d/c]	2ndF d/c	33 ⁷ ²⁰
→[a.xxx]	a^bc	1.65

* ⁴₇ ⁵₇ ⁶₆ = 4 ⁵₆

[9] ◀BIN ▶PEN ◀OCT ▶HEX ◀DEC NEG NOT AND OR XOR XNOR		
DEC(25)→BIN	ON/C 2ndF ◀DEC 25 2ndF ▶BIN	11001^b
HEX(1AC)	2ndF ▶HEX 1AC	
→BIN	2ndF ▶BIN	110101100^b
→PEN	2ndF ▶PEN	3203^P
→OCT	2ndF ▶OCT	654^O
→DEC	2ndF ▶DEC	428.
BIN(1010−100)	2ndF ▶BIN (1010 − 100)	
×11 =	× 11 =	10010^b
BIN(111)→NEG	NEG 111 =	1111111001^b
HEX(1FF)+OCT(512)=	2ndF ▶HEX 1FF 2ndF ◀OCT + 512 =	1511^O
HEX(?)	2ndF ▶HEX	349^H
2FEC−2C9E=(A)	ON/C STO M 2ndF ▶HEX 2FEC − 2C9E M+	34E^H
+2000−1901=(B)	2000 − 1901 M+	6FF^H
(C)	RCL M	A4d^H
1011 AND 101 = (BIN)	ON/C 2ndF ▶BIN 1011 AND 101 =	1^b
5A OR C3 = (HEX)	2ndF ▶HEX 5A OR C3 =	db^H
NOT 10110 = (BIN)	2ndF ▶BIN NOT 10110 =	1111101001^b
24 XOR 4 = (OCT)	2ndF ▶OCT 24 XOR 4 =	20^O
B3 XNOR 2D = (HEX)	2ndF ▶HEX B3 XNOR 2D =	FFFFFFF6^H
→DEC	2ndF ▶DEC	−159.

[10] D°M'S ↔DEG		
12°39'18.05"	ON/C 12 D°M'S 39 D°M'S 18.05	
→ [10]	2ndF ↔DEG	12.65501389
123.678	123.678 2ndF ↔DEG	123°40'40.8"
→ [60]		
3h30m45s + 6h45m36s = [60]	3 D°M'S 30 D°M'S 45 + 6 D°M'S 45 36 =	10°16'21"
1234°56'12" + 0°0'34.567" = [60]	1234 D°M'S 56 D°M'S 12 + 0 D°M'S 0 D°M'S 34.567 =	1234°56'47"
3h45m − 1.69h = [60]	3 D°M'S 45 − 1.69 =	2°3'36"
sin62°12'24" = [10]	sin 62 D°M'S 12 D°M'S 24 =	0.884635235

[11] →Fθ →XY → ←→		
$\begin{cases} x = 6 \\ y = 4 \end{cases} \rightarrow \begin{cases} r = \\ \theta = [^\circ] \end{cases}$	ON/C 6 2ndF → 4 2ndF →Fθ [r] 2ndF ←→ [θ] 2ndF ←→ [r]	7.211102551 33.69006753 7.211102551

[12] MDF SET UP		
5÷9=ANS	ON/C SET UP (0) 0 SET UP (1) 1	
ANS×9=	5 ÷ 9 =	0.6
[FIX,TAB=1]	× 9 = ^{*1}	5.0
	5 ÷ 9 = 2ndF MDF	0.6
	× 9 = ^{*2}	5.4
	SET UP (0) 3	

^{*1} 5.5555555555555×10^{−1}×9

^{*2} 0.6×9

[13] DATA (x,y) X̄ Sx σx n Σx Σx² ȳ

SY σy Σy Σy² Σxy r a b c

X' y' ←→

DATA

95 80 80 75 75 50

(MODE) 1 0

95 (DATA) 80 (DATA) (DATA) 75 (DATA) 3 (DATA) 50 (DATA)

0. 1. 2. 3. 4. 5.

X̄= 75.71428571

σx= 12.37179148

n= 7.

Σx= 530.

Σx²= 41'200.

ȳ= 13.3630621

σy= 178.5714286

X'² X'²

(95-X̄) / Sx x10+50=

(95 - ALPHA X̄)

÷ ALPHA Sx X 10

+ 50 =

64.43210706

x y

2 5 2 5 12 24 21 40 21 40 21 40 15 25

(MODE) 1 1

2 (x,y) 5 (DATA) (DATA) 12 (x,y) 24 (DATA) 21 (x,y) 40 (x,y) 3 (DATA) 15 (x,y) 25 (DATA)

0. 1. 2. 3. 4. 5.

(RCL) a 1.050261097

(RCL) b 1.826044386

(RCL) r 0.995176343

(RCL) Sx 8.541216597

(RCL) Sy 15.67223812

x=3 → y'=?

y=46 → x'=?

3 (2ndF) y'

46 (2ndF) X'

6.528394256

24.61590706

x y

12 41 8 13 5 2 23 200 15 71

(MODE) 1 2

12 (x,y) 41 (DATA) 8 (x,y) 13 (DATA) 5 (x,y) 2 (DATA) 23 (x,y) 200 (DATA) 15 (x,y) 71 (DATA)

0. 1. 2. 3. 4. 5.

(RCL) a 5.357506761

(RCL) b -3.120289663

(RCL) c 0.503334057

x=10 → y'=?

y=22 → x'=?

10 (2ndF) y'

22 (2ndF) X'

(2ndF) ←→

(2ndF) ←→

24.4880159

9.63201409

-3.432772026

9.63201409

[14] DATA ▲ ▼

DATA

30 40 40 50

(MODE) 1 0

30 (DATA) 40 (x,y) 2 (DATA) 50 (DATA)

0. 1. 2. 3.

↓

DATA

30 45 45 45 60

▼ ▼ ▼

45 (x,y) 3 (DATA) ▼

X2 = 45.

N2 = 3.

▼ 60 (DATA)

X3 = 60.

[15]


$$\bar{x} = \frac{\sum x}{n}$$
$$s_x = \sqrt{\frac{\sum x^2 - n\bar{x}^2}{n-1}}$$
$$\bar{y} = \frac{\sum y}{n}$$
$$s_y = \sqrt{\frac{\sum y^2 - n\bar{y}^2}{n-1}}$$

$$\sigma_x = \sqrt{\frac{\sum x^2 - n\bar{x}^2}{n}}$$
$$\Sigma x = x_1 + x_2 + \dots + x_n$$
$$\Sigma x^2 = x_1^2 + x_2^2 + \dots + x_n^2$$

$$\sigma_y = \sqrt{\frac{\sum y^2 - n\bar{y}^2}{n}}$$
$$\Sigma xy = x_1y_1 + x_2y_2 + \dots + x_ny_n$$
$$\Sigma y = y_1 + y_2 + \dots + y_n$$
$$\Sigma y^2 = y_1^2 + y_2^2 + \dots + y_n^2$$

Function	Dynamic range
$\sin x, \cos x, \tan x$	DEG: $ x < 10^{10}$ ($\tan x : x \neq 90 \text{ (2n-1)}^\circ$)* RAD: $ x < \frac{\pi}{180} \times 10^{10}$ ($\tan x : x \neq \frac{\pi}{2} \text{ (2n-1)}$)* GRAD: $ x < \frac{10}{9} \times 10^{10}$ ($\tan x : x \neq 100 \text{ (2n-1)}$)*
$\sin^{-1}x, \cos^{-1}x$	$ x \leq 1$
$\tan^{-1}x, \sqrt[n]{x}$	$ x < 10^{100}$
$\ln x, \log x$	$10^{-99} \leq x < 10^{100}$
y^x	<ul style="list-style-type: none">$y > 0$: $-10^{100} < x \log y < 100$$y = 0$: $0 < x < 10^{100}$$y < 0$: $x = n$ ($0 < x < 1; \frac{1}{x} = 2n-1, x \neq 0$)*, $-10^{100} < x \log y < 100$
$x\sqrt[y]{y}$	<ul style="list-style-type: none">$y > 0$: $-10^{100} < \frac{1}{x} \log y < 100$ ($x \neq 0$)$y = 0$: $0 < x < 10^{100}$$y < 0$: $x = 2n-1$ ($0 < x < 1; \frac{1}{x} = n, x \neq 0$)*, $-10^{100} < \frac{1}{x} \log y < 100$
e^x	$-10^{100} < x \leq 230.2585092$
10^x	$-10^{100} < x < 100$
$\sinh x, \cosh x, \tanh x$	$ x \leq 230.2585092$
$\sinh^{-1} x$	$ x < 10^{50}$
$\cosh^{-1} x$	$1 \leq x < 10^{50}$
$\tanh^{-1} x$	$ x < 1$
x^2	$ x < 10^{50}$
x^3	$ x < 2.15443469 \times 10^{33}$
$\sqrt[n]{x}$	$0 \leq x < 10^{100}$
x^{-1}	$ x < 10^{100}$ ($x \neq 0$)
$n!$	$0 \leq n \leq 69^*$
nPr	$0 \leq r \leq n \leq 9999999999^*$ $\frac{n!}{(n-r)!} < 10^{100}$
nCr	$0 \leq r \leq n \leq 9999999999^*$ $0 \leq r \leq 69$ $\frac{n!}{(n-r)!} < 10^{100}$
$\leftrightarrow \text{DEG, D}^\circ\text{M'S}$	$0^\circ 0' 0.00001'' \leq x < 10000''$
$x, y \rightarrow r, \theta$	$\sqrt{x^2 + y^2} < 10^{100}$
$r, \theta \rightarrow x, y$	$0 \leq r < 10^{100}$ DEG: $ \theta < 10^{10}$ RAD: $ \theta < \frac{\pi}{180} \times 10^{10}$ GRAD: $ \theta < \frac{10}{9} \times 10^{10}$
DRG ►	DEG→RAD, GRAD→DEG: $ x < 10^{100}$ RAD→GRAD: $ x < \frac{\pi}{2} \times 10^{99}$
→DEC →BIN →PEN →OCT →HEX AND OR XOR XNOR	DEC : $ x \leq 9999999999$ BIN : $1000000000 \leq x \leq 1111111111$ $0 \leq x \leq 1111111111$ PEN : $2222222223 \leq x \leq 4444444444$ $0 \leq x \leq 2222222222$ OCT : $4000000000 \leq x \leq 7777777777$ $0 \leq x \leq 3777777777$ HEX : FDABF41C01 $\leq x \leq$ FFFFFFFF $0 \leq x \leq 2540BE3FF$
NOT	BIN : $1000000000 \leq x \leq 1111111111$ $0 \leq x \leq 1111111111$ PEN : $2222222223 \leq x \leq 4444444444$ $0 \leq x \leq 2222222221$ OCT : $4000000000 \leq x \leq 7777777777$ $0 \leq x \leq 3777777777$ HEX : FDABF41C01 $\leq x \leq$ FFFFFFFF $0 \leq x \leq 2540BE3FE$
NEG	BIN : $1000000001 \leq x \leq 1111111111$ $0 \leq x \leq 1111111111$ PEN : $2222222223 \leq x \leq 4444444444$ $0 \leq x \leq 2222222222$ OCT : $4000000001 \leq x \leq 7777777777$ $0 \leq x \leq 3777777777$ HEX : FDABF41C01 $\leq x \leq$ FFFFFFFF $0 \leq x \leq 2540BE3FF$

* n, m, r: integer



ENGLISH

Information on the Disposal of this Equipment and its Batteries

1. In the European Union

Attention: If you want to dispose of this equipment, please do not use the ordinary dust bin!

Used electrical and electronic equipment must be treated separately and in accordance with legislation that requires proper treatment, recovery and recycling of used electrical and electronic equipment.

Following the implementation by member states, private households within the EU states may return their used electrical and electronic equipment to designated collection facilities free of charge*. In some countries* your local retailer may also take back your old product free of charge if you purchase a similar new one.

*) Please contact your local authority for further details.

If your used electrical or electronic equipment has batteries or accumulators, please dispose of these separately beforehand according to local requirements.

By disposing of this product correctly you will help ensure that the waste undergoes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health which could otherwise arise due to inappropriate waste handling.

2. In other Countries outside the EU

If you wish to discard this product, please contact your local authorities and ask for the correct method of disposal.

Manufactured by:

SHARP CORPORATION

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For EU only:

Imported into Europe by:

MORAVIA Consulting spol. s r.o.

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For UK only:

Imported into UK by:

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