hp 9s

Scientific Calculator

General Operations

Power Supply

On or Off

To turn the calculator on, press [ON/C].

To turn the calculator off, press [2ndF] [OFF].

Auto power-off function

The calculator automatically turns off if it has not been used for approximately 9 minutes. Power can be restored by pressing the [ON/C] key again. Memory contents and the current mode setting (STAT, DEG, CPLX, Base-n,etc) are retained when you turn off the power and when the calculator automatically turns off.

Battery replacement

The calculator is powered by two alkaline button batteries (GP76A or LR44). If the display becomes dim and difficult to read, the batteries should be replaced as soon as possible.

3. Replace the battery cover and press [ON/C] to turn on the power

To replace the batteries:

- 1. Slide the battery cover off and remove the old batteries.
- 2. Insert new batteries, with positive polarity facing outward

The keyboard Most of the keys can perform two functions.

2nd function ———	sin ⁻¹
1st function ——	sin
1st functions	

These are functions that are executed when you press a key without first pressing [2ndF]. The function performed is indicated by the label on the key.

2nd functions

These are functions that are executed when you press a key after first pressing [2ndF]. The function performed is indicated by the label above the key.

When you press [2ndF], the **2ndF** indicator appears in the display to indicate that you will be selecting the second function of the next key you press. If you press [2ndF] by mistake, simply press [2ndF] again to remove the 2ndF indicator

Note: [A], [B], [C], [D], [E], [F] are 1st functions in HEX mode

Display Symbols

The following symbols, shown on the display, indicate the status of the calculator

DEG or RAD or GRAD: degrees, radians or grads angular unit					
M	A value is in memory	CPLX	Complex number mode		
E	Overflow or error	STAT	Statistical mode		
-	Minus	2ndF	[2ndF] key pressed		
()	Parentheses calculation	CP	Precision capability		
BIN	Binary mode	CPK	Process capability		
OCT	Octal mode	σ	Deviation		
HEX	Hexadecimal mode	USL	Setting upper limit		
ED	Edit mode	LSL	Setting lower limit		
HYP	Hyperbolic mode				

Display Formats

The calculator can display numbers in four formats: floating point, fixed point, scientific, and engineering.

Floating point format

The floating point format displays numbers in decimal form, using up to 10 digits. Any trailing zeros are truncated.

If the result of a calculation is too large to be represented by 10 digits, the display automatically switches to scientific format. If the result of a later calculation is small enough to be displayed in less than 10 digits. the calculator returns to floating point format.

To set the display to floating point display format

1. Press [2ndF] [FIX] [•]

0. Fixed point format The fixed point, scientific, and engineering formats use a fixed

number of decimal places to display numbers. If more than the specified number of decimal places is keyed, the entry will be rounded to the correct number of decimal places. Ex. 1: Fix the display at 2 decimal places, then key in 3.256

1. Press [2ndF] [FIX] 2 0.00 3.26

	If fewer than the set number of decimal places is keyed, the entry will be padded with trailing zeros.					
Ex.	Ex. 2: Fix the display at 4 decimal places, then key in 4.23					
1.	Press [2ndF] [FIX] 4	DEG	0.0000			
2.	Key in 4.23 [ENTER]	DEG	4.2300			

Scientific format

2. Key in 3.256 [ENTER]

In scientific format, the number 891500 is shown as 8.915 \times 10 05 where 8.915 is the mantissa and 5 is the exponent of 10

Ex. 3: To display 7132 × 125 in scientific format:

1. Key in 7132 [×] 125 [ENTER] 891500. 8.915 2. Press [F ↔ E] You can convert an entry to scientific notation by pressing [EXP] after

entering the mantissa.

Ex. 4: Key the number 4.82296 × 10 5

4.82296 05 1. Key in 4.82296 [EXP] 5

Engineering format

Engineering format is similar to scientific format, except that the sa can have up to three digits to the left of the decimal and the

exponent is always a multiple of three. This is useful if you have to convert units that are based on multiples of 10 3.							
Ex. 5	x. 5: Convert 15V to 15000mV (V = Volts)						
1.	Key in 15	DEG	15.				
2.	Press [ENG] twice.	DEG 1	5000. ¯	- 03			
Ex. 6: Convert 15V to 0.015KV (V = Volts)							
1.	Key in 15	DEG	15.				
2.	Press [2ndF] [←] [2ndF] [←]	DEG	0.015	03			

Order of Operations

Each calculation is performed in the following order of precedence:

- Operations in parentheses.
- 2. Functions that require pressing the function key before entering a value, for example, [DATA] in statistics mode, and [EXP].
- Functions that require values to be entered before pressing the function key, for example, cos, sin, tan, cos $^{-1}$, sin $^{-1}$, tan $^{-1}$, log, ln, x 2 , x $^{-1}$, $\sqrt{}$, π , $\sqrt[3]{}$, xl, %, RND, ENG, \rightarrow eın , eın \rightarrow , and the unit conversion functions.
- 4. Fractions. 5. +/-
- 6. x ^y. ^x√
- 7. nPr. nCr
- 8. ×, ÷
- 9. +, -

Corrections

If you have made a mistake when entering a number and you have not yet pressed an arithmetic operator key, just press [CE] to clear the last entry. You can then input the desired number again. Alternatively, you can delete digits one at a time by pressing the backspace key: [$00\rightarrow0$].

Ex. 7: Change 12385 to 789

Ex. 8: Change 12385 to 123

2. Press [00→0] twice.

then the correct arithmetic key.

the previously displayed value.

Accuracy and Capacity

Functions

sin x, cos x, tan x

sin -1 x, cos -1 x

sinh x, cosh x

tan -1 x

tanh x

sinh -1 x

cosh -1 x

tanh -1 x

log x, In

10 ^x

e x

 \sqrt{x}

 x^2

3√x

Х!

R→P

P→R

→0 1 11

o,,,→

∛Y

a ^b/c

nPr, nCr

→DEC

→OCT

→HEX

STAT

Accuracy: ±1 in the 10th digit.

1. Key in 12385

Exchange key

123 + 456 = ?

- 2. Press [CE] 789
- 1. Key in 12385

In a series of calculations, you can correct errors in intermediate

results by pressing [ON/C]. This clears the calculation without clearing

If you press the wrong arithmetic operation key, just press [CE] and

Capacity: In general, calculations can be displayed as a mantissa of up to 10 digits, a 10-digit mantissa together with a 2-digit exponent up to 10 $^{\pm99}$, or as an integer between –999999999 and 999999999.

Deg: $|x| < 4.5 \times 10^{10} deg$

Rad: $|x| < 2.5 \times 10^8 \pi \text{ rad}$

Grad: $|x| < 5 \times 10^{10}$ grad

Deg: | x | ≠ 90 (2n +1)

Rad: $|x| \neq \frac{\pi}{2}(2n + 1)$

Grad: $|x| \neq 100 (2n + 1)$

where n is an integer.

 $|x| < 1 \times 10^{100}$

| x | < 1 × 10 100

 $|x| < 5 \times 10^{99}$

 $1 \le x < 5 \times 10^{99}$

 $1 \times 10^{-99} \le x < 1 \times 10^{100}$

 $\overline{-1 \times 10^{100}} < x \le 230.2585092$

 $0 \le x \le 69$, where x is an integer

 $-1 \times 10^{100} < x < 100$

 $\mid x \mid <$ 1 × 10 $^{100},$ X \neq 0

 $0 \le x < 1 \times 10^{100}$

x | < 1 × 10 ⁵⁰

x | < 1 × 10 100

 $\sqrt{x^2 + y^2} < 1 \times 10^{100}$ $0 \le r < 1 \times 10^{100}$

Also, for tan x:

Deg : $\mid \theta \mid$ < 4.5 × 10 ¹⁰ deg

Rad : $\mid \theta \mid$ < 2.5 × 10 $^8\pi$ rad

Grad : $\mid \theta \mid$ < 5 × 10 ¹⁰ grad

Deg : $\mid \theta \mid \neq$ 90 (2n+1)

Rad : $\mid \theta \mid \neq \frac{\pi}{2}$ (2n+1)

Grad : $|\theta| \neq 100 \text{ (2n+1)}$

 \mid DD \mid , MM, SS.SS $< 1 \times 10^{100}$,

 $x > 0 : -1 \times 10^{100} < y log x < 100$

but $-1 \times 10^{100} < \frac{1}{11} \log |x| 100$

where n is an integer other than 0

but $-1 \times 10^{100} < \frac{1}{y} \log |y| 100$

Input: The integer, numerator, denominato

and fraction symbols must in total be no

Result : Displayed as a fraction when the

integer, numerator and denominator are each less than 1 \times 10¹⁰.

 $|x| < 1 \times 10^{50}$, $|\Sigma x| < 1 \times 10^{100}$ 0 $\leq |\Sigma x^{2}| < 1 \times 10^{100}$; n, r are integer

Range = 1 ~ r, 1≦n≦r, 80≦r≦20400

 $0 \le X \le 2540BE3FF$ (for zero or positive)

FDABF41C01 \leq X \leq FFFFFFFFF (for

0111111111 (for

 $1000000000 \, \leq \, \, X \, \, \leq \, \, 1111111111$

 $: n \neq 0, S : n > 1, \sigma : n > 0$

 $0 \le r \le n$, $n \le 99999999999$; *n*, *r* are integers.

 $y > 0 : x \neq 0, -1 \times 10^{100} < \frac{1}{x} \log y < 100$

where n is an integer

 $0 \leq MM, SS.SS$

 $| x | < 1 \times 10^{100}$

x < 0 : y = n, 1/(2n+1)

where n is an integer

x = 0 : y > 0

y = 0 : x > 0

y < 0 : x =2n+1, l/n

more than 10 digits

positive)

(for negative)

(for negative)

negative)

The symbol E appears when any of the following conditions occur. Press [ON/C] to remove the overflow or error indicator.

When you have pressed the [(] key more than 15 times in a

in the calculator becomes locked and pressing keys has no effect, press [M+] and [ENG] at the same time. This unlocks the calculator and returns all settings to their default values.

If the calculator becomes locked and pressing keys has no effect

The following examples of basic calculations assume that your

calculator is in decimal base and with floating point display

When you attempt to perform a function calculation with a number

Overflow and Error Conditions

outside the allowable input range.

single expression.

Basic Calculations

When you attempt to divide a number by 0.

When there are more than six pending operations

x | < 1

x | \(\le \) 230.2585092

 $|x| \le 1$

Allowable input range

Numbers used as input to a particular function must be within the allowable range for that function (as set out in the following table)

123 [+] 456 [ENTER]

[2ndF] [X↔Y]

[2ndF] [X↔Y]

789

123.

579.00

456.00

579.00

Mixed Arithmetic Calculations

	1 [+] 2 [×] 3 [ENTER]	DEG	7.
-3.5 + 8 ÷2 = ?	3.5 [+/-] [+] 8 [÷] 2 [ENTER]	DEG	0.5

Parentheses Calculations

Operations inside parentheses are always executed first. You can specify up to 15 levels of parentheses in a single calculation. When you enter the first parenthesis, the () indicator appears on the display and remains until each opening parenthesis has a corresponding closing parenthesis.

= ?	[(]5[-]2[×]1.5[)][×]3 [+]0.8[×]4[+/-][ENTER]	DEG	2.8
$2 \times (7 + 6 \times (5 + 4)) = ?$	2[×][(]7[+]6[×][(]5 [+]4[ENTER]	DEG	122.

Note: It is not necessary to press [)] before [ENTER].

Repeating a Calculation

You can repeat the last number entered, or the last operation executed, by pressing [ENTER].

3 [×] [ENTER]

Repeating the last number

3 × 3 = ?	3 [^] [[[[]] []]		9.
$3 \times 3 \times 3 = ?$	[ENTER]	DEG	27.
$3 \times 3 \times 3 \times 3 = ?$	[ENTER]	DEG	81.
Repeating the last	arithmetic operation		
321 + 357 = ?	321 [+] 357 [ENTER]	DEG	678.
654 + 357 = ?	654 [ENTER]	DEG	1011.
		Inco	
579 – 159 = ?	579 [-] 159 [ENTER]	DEG	420.
456 – 159 = ?	456 [ENTER]	DEG	297.
r	T	DEG	
18 × 45 = ?	3 [×] 6 [×] 45 [ENTER]	DEG	810.
18 × 23 = ?	23 [ENTER]	DEG	414.
$18 \times (0.5 \times 10^2) = ?$	0.5 [EXP] 2 [ENTER]	DEG	900.
F		DEG	
96 ÷ 8 = ?	96 [÷] 8 [ENTER]		12.
75 ÷ 8 = ?	75 [ENTER]	DEG	9.375
$(1.2x10^2) \div 8 = ?$	1.2 [EXP] 2 [ENTER]	DEG	15.

Percentage Calculations				
30% of 120 = ?	120 [×] 30 [2ndF] [%] [ENTER]	DEG	36.	
70% of 120 = ?	70 [2ndF] [%] [ENTER]	DEG	84.	
88 is 55% of what number?	88 [÷] 55 [2ndF] [%] [ENTER]	DEG	160.	
30% mark up of 120 = ?	120 [+] 30 [2ndF] [%] [ENTER]	DEG	156.	
30% discount of 120 = ?	120 [–] 30 [2ndF] [%] [ENTER]	DEG	84.	

Memory Calculations

- The **M** indicator appears when a number is stored in memory.
- Recalling from memory does not delete the contents of memory.
- The memory is not available when you are in statistics mode.
- To copy the displayed number to memory, press [$X\rightarrow M$].
- To clear the memory, press [0] [$X \rightarrow M$], or [CE] [$X \rightarrow M$], in that order.

[CE][X→M]	DEG	0.
3[×]5[M+]	M DEG	15.
56 [÷] 7 [M+]	M DEG	8.
74 [–] 8 [×] 7 [M+]	M DEG	18.
[MR]	M DEG	41.
0 [X→M]	DEG	0.
	3[x]5[M+] 56[÷]7[M+] 74[-]8[x]7[M+] [MR]	3[x]5[M+] M DEG 56[÷]7[M+] M DEG 74[-]8[x]7[M+] M DEG [MR] DEG

Common Math Calculations

The following example calculations assume that your display is fixed at 2 decimal places.

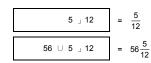
Reciprocal, Factorial

$\frac{1}{1.25}$ = ?	1.25 [2ndF] [x ⁻¹] [ENTER]	DEG	0.80	
5! = ?	5 [2ndF] [x!] [ENTER]	DEG	120.00	
Square, Square Ro	ot, Cube Root, Power, Other F	Roots		
$2^2 + 3^4 = ?$	2 [x ²] [+] 3 [x ^y] 4 [ENTER]	DEG	85.00	
$5 \times \sqrt[3]{27} + \sqrt{34} = ?$	5 [×] 27 [2ndF] [³ √] [+] 34 [√] [ENTER]	DEG	20.83	
9 √72 = ?	72 [2ndF] [^X √] 9 [ENTER]	DEG	1.61	
Logarithms and Antilogarithms				
In7 + log100 = ?	7 [In] [+] 100 [log] [ENTER]	DEG	3.95	
10 ² = ?	2 [2ndF] [10 *] [ENTER]	DEG	100.00	

5 [2ndF] [e ^x] [–] 2 [+/–] [2ndF] [e ^x] [ENTER] Fraction calculations

 $e^{5} - e^{-2} = ?$

Fractions are displayed as follows



Note: The display is truncated if the integer, numerator, denominator and fraction symbols together are more than 10 digits.

Press [2ndF] [\rightarrow d/c] to convert the displayed value to an improper

$\frac{2}{3} + 7\frac{3}{5}$ $= 8\frac{4}{12}$	2 [a ^b /c] 3 [+] 7 [a ^b /c] 3 [a ^b /c] 5 [ENTER]	DEG	8∪ 4 」15
$= \frac{15}{124} = \frac{15}{15}$	[2ndF] [→d/c]	DEG	124 」15

If you press [a $^{\rm b}$ /c] after pressing [ENTER], or if a fraction was combined with a decimal number, the answer is displayed as a decimal number

5[ab/c]4[ab/c]9[+]3 DEG 9 ∪ 7」36 = 9.19[ab/c] 9.19 8[ab/c]4[ab/c]9[+] $8\frac{4}{9} + 3.75 = 12.19$ 3.75 [ENTER]

Where possible, a fraction is reduced to its lowest terms after you

press [+], [-], [*], [-] or [ENTER].						
	$3\frac{119}{21} = 8\frac{2}{3}$	3 [a ^b /c] 119 [a ^b /c] 21 [ENTER]	DEG	8 U 2 3		
	A result is displayed in decimal format if the integer, numerator,					

denominator and fraction symbols are together more than 10 digits

$12345\frac{5}{16} + 5\frac{6}{13}$ $= 12350.77$	12345 [a b/c] 5 [a b/c] 16 [+] 5 [a b/c] 6 [a b/c] 13 [ENTER]	DEG	12350.77

Converting Angular Units

You can specify an angular unit of degrees (DEG), radians (RAD), or grads (GRAD). You can also convert a value expressed in one angular unit to its corresponding value in another angular unit. The relation between the angular units is:

 $180^{\circ} = \pi \text{ radians} = 200 \text{ grads}$

- To change the angular unit setting to another setting, press [DRG] repeatedly until the angular unit you want is indicated in the display.

	repeatedly until the value is converted to the desired unit.					
)° (deg)	90	DEG	90.		
= '	? (rad)	[2ndF] [DRG→]	RAD	1.57		
= '	? (grad)	[2ndF] [DRG→]	GRAD	100.00		

Trigonometric and Inverse Trigonometric Functions

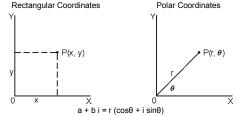
Before undertaking a trigonometric or inverse trigonometric calculation, make sure that the appropriate angular unit is s

odiodiation, make our caractic appropriate angular unit is set.				
3 sin 85° = ?	3 [×] 85 [sin] [ENTER]	DEG	2.99	
$\cos\left(\frac{\pi}{4} \text{ rad}\right) = ?$	[2ndF][π][\div]4 [ENTER] [\cos]	RAD	0.71	
tan 150 grad = ?	150 [tan]	GRAD	-1.00	
sin ⁻¹ 0.5 = ? deg	0.5 [2ndF] [sin ⁻¹]	DEG	30.00	
$\cos^{-1}\left(\frac{1}{\sqrt{2}}\right) =$? rad	$2[\sqrt{\]}[2ndF][x^{-1}][2ndF]$	RAD	0.79	
tan ⁻¹ 1 = ? grad	1 [2ndF] [tan -1]	GRAD	50.00	

Hyperbolic and Inverse hyperbolic functions

	1.5 [HYP] [cos] [+] 1.5 [HYP] [sin] [ENTER]	DEG	4.48
sinh ⁻¹ 7 = ?	7 [HYP] [2ndF] [sin ⁻¹]	DEG	2.64
tanh 1 = ?	1 [HYP] [tan]	DEG	0.76

Rectangular and Polar coordinates



Note: Before undertaking a coordinates conversion calculation, make

sure that the appropriate angular unit is set. Converting from Rectangular to Polar If a = 5 and b = 6, $5[a]6[b][2ndF][R \rightarrow P]$ DEG

what are r and θ ?	[b]	DEG	50.19				
Converting from Polar to Rectangular							
If $r = 25$ and $\theta = 56^\circ$, what are a	25 [a] 56 [b] [2ndF] [P→R]	DEG	13.98				
and b?	[b]	DEG	20.73				

Permutations and Combinations

$$nPr = \frac{n!}{(n-r)!} \qquad nCr = \frac{n!}{r!(n-r)!}$$

(n – r)!	r!(n-r)!		
How many permutations of 4 items can you select from a set of 7 items?	7 [2ndF] [nPr] 4 [ENTER]	DEG	840.00
How many combinations of 4 items can you select from a set of 7 items?	7 [2ndF] [nCr] 4 [ENTER]	DEG	35.00

Sexagesimal \leftrightarrow Decimal form Conversions

You can convert a sexagesimal figure (degree, minute and second) to a decimal number by pressing [\circ 1 and convert a decimal number to a sexagesimal figure by pressing [2ndf] [\rightarrow 0 in]. Sexagesimal figures are displayed as follows:

= 12 degrees, 45 minutes, 30.5 12 45 30 15 seconds

Note: If the total number of digits in a DD, MM and SS.SS figure exceeds 8, the figure is truncated.

12 deg., 45 min., 30.5 sec.= ?	12 [o·»→] 45 [o·»→] 30.5 [o·»→]	DEG	12.76
Converting from De			
2.12345 = ?	2.12345 [2ndF] [→017]	DEG 2	¹ 7

Base-n Calculations Converting between bases

Converting from Sexagesimal to Decimal

You can add, subtract, multiply, and divide binary, octal, and hexadecimal numbers in addition to decimal numbers. Select the number base you want by pressing $[\neg BIN]$, $[\neg OCT]$, $[\neg HEX]$, or

[→DEC]. The BIN, OCT, and HEX indicators show you which base

you are using. (If none of these indicators is displayed, you are using decimal base.)

The number keys that are active in a particular base are: Binary base: [0] and [1]

Octal base: [0] to [7] Decimal base: [0] to [9]

148.28

al base: [0] to [9] and [A] to [F]

	i lexauecimai base.				
	31 (base 10)	[2ndF] [→DEC] 31	DEG		31.
	= ? (base 2)	[2ndF] [→BIN]	DEG	BIN	11111.
	= ? (base 8)	[2ndF] [→OCT]	DEG	OCT	37.
	= ? (base 16)	[2ndF] [→HEX]	DEG	HEX	1F.
:	4 × 1B (base 16) = ? (base 2) = ? (base 10)	[2ndF] [→HEX] 4 [×] 1B [ENTER]	DEG	HEX	6C.
		[2ndF] [→BIN]	DEG	BIN 1	101100.
		[2ndF] [→DEC]	DEG		108.00
	= ? (base 8)	[2ndF] [→OCT]	DEG	OCT	154

Negative Numbers and Complements

In binary, octal, and hexadecimal bases, negative numbers are expressed as complements. The complement is the result of subtracting that number from 1000000000 in that number's base

rou do this by pressing [+/-] in a non-decimal base.						
Calculate the complement of binary number 11011	[2ndF] [→BIN] 11011 [+/–]	DEG BIN 1111100101.				

Complex Number Calculations

Press [CPLX] to enter complex number mode. The CPLX indicator appears on the display. You can add, subtract, multiply, and divide complex numbers.

Complex numbers are generally represented as a + b i, where a is the real part and bi is the imaginary part.

(7-9i)+ (15+10i)=?	[2ndF][CPLX]7[a]9 [+/-][b][+]15[a]10[b] [ENTER]	DEG	CPLX	22.00
([b]	DEG	CPLX	1.00

Note: Memory calculation is available in complex number mode Random Numbers

Press [2ndF] [RND] to generate a random number between 0.000 and 0.999. **Unit Conversions**

[$lb \rightarrow kg$] and [$oz \rightarrow g$]. The following example illustrates the general procedure for converting values from one unit to another. 12 [A→B] [2ndF] [in↔cm] 98 [2ndF] [A←B] [2ndF] 98 cm = ? in 38.58

Statistics

Press [2ndF] [STAT] to enter statistics mode. The STAT indicator appears on the display. In statistics mode you can calculate the following single-variable statistics:

- number of data items
- sum of the values of all the data items Σx^2 sum of the squares

[in ←cm]

- x
- sample standard deviation $\sqrt{\frac{\sum x^2 (\sum x)^2 / n}{n-1}}$
 - population standard deviation $\sqrt{\frac{\sum x^2 (\sum x)^2 / n}{n}}$

Continued on other side

precision capability $\frac{\text{USL-LSL}}{6\,\sigma}$ CP CPK process capability Min(CPU, CPL) where CPU = $\frac{USL - \overline{x}}{3\sigma}$ CPL = $\frac{\overline{x} - LSL}{3\sigma}$

Note: In statistics mode, all function keys are available except those

used for base-n calculations.									
Ex. 9: Enter the following data $\{2, 5, 5, 5, 5, 9, 9, \text{ and } 9\}$ and calculate Σx , Σx^2 , n, \overline{x} , S, CP, and CPK, where USL value = 12 and LSL value = 2.									
In STAT mode [2ndF][STAT] DEG STAT 0.00									
	[DATA]2	DEG	STAT	2.					
	[DATA] 5	DEG	STAT	5.					
	[DATA]5	DEG	STAT	5.					
	[DATA] 5	DEG	STAT	5.					
Enter all data	[DATA] 5	DEG	STAT	5.					
	[DATA]9	DEG	STAT	9.					
	[DATA] 9	DEG	STAT	9.					
	[DATA]9	DEG	STAT	9.					
	[ENTER]	DEG	STAT	0.00					
?	[x]	DEG	STAT	6.13					
n = ?	[n]	DEG	STAT	8.00					
S = ?	[S]	DEG	STAT	2.59					
Σx = ?	[2ndF] [Σx]	DEG	STAT	49.00					
$\Sigma x^2 = ?$	[2ndF] [Σx ²]	DEG	STAT	347.00					
σ= ?	[2ndF] [σ]	DEG	STAT	2.42 σ					
	[2ndF] [CP] 12	DEG	STAT	12. CP USL					
CP = ?	[ENTER] 2	DEG	STAT	2. CP LSL					
	[ENTER]	DEG	STAT	0.69 ^{CP}					
	[2ndF] [CPK]	DEG	STAT	12.00 CPK					
CPK = ?	[ENTER]	DEG	STAT	2.00 CPK LSL					
	[ENTER]	DEG	STAT	0.57 ^{CPK}					

Note: The calculator retains the data you have entered until you exit statistics mode. The data is retained even if you turn off the calculator or it automatically turns off.

Viewing Statistics Data

Press [DATA] or [ENTER] in edit (ED) mode to view the statistics data you have entered. (If you press [DATA] the item number of the data appears briefly before the value.)

Ex.10: View the data entered in Ex. 9.

1. Press [2ndF] [EDIT] to enter edit mode.

2. Press [DATA] once to view the first data item.

1.5 seconds →

3. Continue pressing [DATA] to display each data item. You will see data 2, 5.00, data 3, 5.00, data 4, 5.00, data 5, 5.00, data 6, 9.00, data 7, 9.00, data 8, 9.00 in sequence.

Method 2

1. Press [ENTER] once to view the first data item.

DEG ED STAT 2.00

2.00

2. Continue pressing [ENTER] to display each data item. You will see 5.00, 5.00, 5.00, 5.00, 9.00, 9.00, 9.00 in sequence.

Adding a Data Item

Ex. 11: To add a 9th data item, of value 10, to the Ex. 9 dataset:

1. Press [DATA] 10

The calculator updates the statistics as you enter data. You can then recall the statistics to get: $\frac{1}{x} = 6.56$, n = 9.00, S = 2.74, $\Sigma x = 59.00$, $\Sigma x^2 = 447.00$ and $\sigma = 2.59$.

Editing Statistics Data

Ex.12: Change the value of data item 1 in Ex. 9 from 2 to 3.

Method 1 1. Press 2 [2ndF] [DEL] 3

Method 2

1. Press [2ndF] [EDIT]

0.00 2.00

2. Display 2 by pressing [DATA] or [ENTER] Enter 3 to overwrite 2.

DEG ED STAT 3.

4. Press [ENTER] to make the change.

5. Press [2ndF] [EDIT] to exit edit mode.

Ex.13: Based on Ex.9, delete the first data entry (of value 2).

Method 1 1. Press 2 [2ndF] [DEL] to delete 2.

Method 2

0.00 Press [2ndF] [EDIT]

DEG ED STAT 2. Display 2 by pressing [DATA] or 3. Press [2ndF] [DEL]

2.00 DEG ED STAT 5.00

4. Press [2ndF] [EDIT] to exit edit mode.

If you try to delete a value that is not in the dataset, **dEL Error** appears. (Existing data is not affected.)

Ex.14: Delete 7 from the dataset in Ex.9.

1. Press 7 [2ndF] [DEL]

dEL Error 0.00

2. Press any key to clear the message. Ex.15: Delete 5 × 5 from the dataset in Ex.9.

1. Press 5 [×] 5 [2ndF] [DEL] dEL Error DEG STAT 2. Press any key to clear the message. 0.00

Weighted Data Entry Method

Instead of entering each data item individually, you can enter the value and the number of occurrences of that value (up to 255). The data from Ex.9 can be entered as follows:

Number of occurrences Alternative method [DATA]5[×]4 3 9 [DATA]9[×]3 where item 1 = 2, items 2 to 5 = 5, and items 6 to 8 = 9.

Error Conditions

The indicator **FULL** appears when any of the following conditions occur. Further data entry is not possible. Press any key to clear the indicator. Providing that you remain in statistics mode, previously entered data entries are unaffected.

- You attempt to enter more than 80 data items.
- The number of occurrences of of any particular data value is greater than 255
- The product of the number of data items and the number of occurrences is greater than 20400.



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Printed in China. (HP part number: F2212-90001)

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