# HP 6S Scientific Calculator

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## REGULATORY INFORMATION

### USA

This calculator has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This calculator generates, uses and can radiate radio frequency energy and may interfere with radio and television reception. In the unlikely event that this equipment does cause interference to radio or television reception, try the following:

- reorient or relocate the receiving antenna
- increase separation between the calculator and the receiver
- consult your dealer or an experienced radio/TV technician for help.

### CANADA

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003.

## Contents

# 1. Keyboard

## General keys

| Key | Functions | Page |
|---|---|---|
| 0 to 9 . | Data entry | 8 |
| + − × ÷ = | Basic calculation | 8 |
| AC | Reset the calculator and clear the memory | 9 |
| C/CE | Clear/clear error | 9 |
| +/− | Change sign | 8 |

## Memory keys

| Key | Functions | Page |
|---|---|---|
| RM | Retrieve data from the independent memory | 11 |
| X→M | Store display data in memory | 11 |
| X↔M | Exchange of display data and contents of memory | 11 |
| M+ | Add displayed data to memory | 11 |

## Special keys

| Key | Functions | Page |
|---|---|---|
| INV | Inverse | 7 |
| MODE | Mode | 7 |
| ( ) | Brackets (parentheses) | 10 |
| Exp | Exponent | 8 |
| π | Pi | 13 |

| Key | Functions | Page |
|---|---|---|
| →DEG →DMS | Sexagesimal/decimal notation conversion | 13 |
| DRG | Mode of angle DEG→RAD→GRAD→DEG | 13 |
| DRG▸ | Angular conversion of data DEG→RAD→GRAD→DEG | 13 |
| X↔Y | Register exchange | 11 |
| ← | Clearing the last entered digit | 9 |
| FIX | Fix the number of digits after the decimal point | 9 |
| FLO | Floating notation | 9 |
| SCI | Scientific notation | 9 |
| ENG | Engineering notation | 15 |

## Base-n keys

| Key | Functions | Page |
|---|---|---|
| DEC | Decimal | 16 |
| BIN | Binary | 16 |
| HEX | Hexadecimal | 16 |
| OCT | Octal | 16 |
| A to F | Hexadecimal numbers only | 16–18 |
| AND | And | 17 |
| OR | Or | 17 |
| XOR | Exclusive Or | 17 |
| XNOR | Exclusive Nor | 17 |
| NOT | Not | 17 |
| NEG | Negative | 18 |

## Function keys

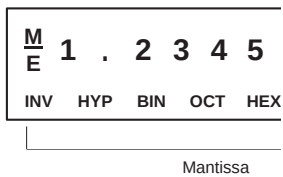
| Key | Functions | Page |
|---|---|---|
| sin | Sine | 13 |
| cos | Cosine | 13 |
| tan | Tangent | 13 |
| $\sin^{-1}$ | Arc sine | 13 |
| $\cos^{-1}$ | Arc cosine | 13 |
| $\tan^{-1}$ | Arc tangent | 13 |
| HYP | Hyperbolic | 14 |
| log | Common logarithm | 14 |
| $10^x$ | Common antilogarithm | 14 |
| ln | Natural logarithm | 14 |
| $e^x$ | Natural antilogarithm | 14 |
| $\sqrt{\ }$ | Square root | 14 |
| $x^2$ | Square | 14 |
| $A^B/_C$ D/C | Fraction | 12 |
| $\sqrt[3]{\ }$ | Cube root | 14 |
| $1/x$ | Reciprocal | 12 |
| $n!$ | Factorial | 14 |

| Key | Functions | Page |
|---|---|---|
| $y^x$ | Power | 8 |
| $\sqrt[x]{y}$ | Root | 14 |
| R▸P | Rectangle to polar | 15 |
| P▸R | Polar to rectangular | 15 |
| % | Percent | 12 |

## Statistical keys

| Key | Functions | Page |
|---|---|---|
| SD | Statistical data mode | 19 |
| DATA | Data entry | 19 |
| DEL | Data delete | 19 |
| $\sigma n$ | Sample standard deviation | 19 |
| $\sigma n{-}1$ | Population standard deviation | 19 |
| $\bar{x}$ | Arithmetic mean | 19 |
| $n$ | Number of data | 19 |
| $\Sigma x$ | Sum of value | 19 |
| $\Sigma x^2$ | Sum of square value | 19 |

# 2. The display




**LCD Diagram**

The display shows input data, interim results and answers to calculations. The mantissa section displays up to 10 digits. The exponent section displays up to ±99.

| Display | Meaning | Page |
|---|---|---|
| -E- | Indicates an error | 9 |
| INV | [INV] has been pressed to enable inverse key functions | 9 |
| M | Indicates that data is stored in the memory | 11 |
| HYP | [HYP] has been pressed for hyperbolic functions | 14 |
| BIN, OCT, HEX | BASE-N mode has been selected | 16 |
| SD | Statistical mode has been selected | 19 |
| DEG, RAD, GRAD | [DRG] has been pressed to switch between the DEG, RAD and GRAD angle types | 13 |
| FIX (this does not display) | The number of decimal places of a displayed value has been set | 9,15 |
| SCI (this does not display) | Converts a displayed value to exponent display | 9 |
| ENG (this does not display) | Converts a displayed value to exponent display of which the exponent is a multiple of 3 and mantissa is between 0 to 999 | 15 |
| FLO (this does not display) | Convert a SCI or ENG form display to a normal display value | 15 |
| 45_12_⌟123 | $45\frac{12}{123}$ | 11 |
| 12.°3'45.6" | Sexagesimal figure 12°3'45.6" | 13 |

## Exponent displays

The display can show calculation results only up to 10 digits long. When an intermediate value or a final result is longer than 10 digits, the calculator automatically switches over to exponential notation. Values greater than 9,999,999,999 are always displayed exponentially.

# 3. Basic functions

## Entering numbers

| | |
|---|---|
| 1 2 3<br>etc<br>• | Press the number keys to enter numbers.<br>Press • for a decimal point. |

## Entering negative numbers

| | |
|---|---|
| +/− | Press after a number to make it negative. |

| | | |
|---|---|---|
| 5 • 0 8 +/− | | -5.08 |

## Entering exponential numbers

| | |
|---|---|
| Exp | Press to enter an exponential number. |

| | | |
|---|---|---|
| $3.08\times10^{9}$ | 3 • 0 8 Exp 9 | $3.08^{09}$ |

## Arithmetic operator

| | |
|---|---|
| + − X<br>÷ $y^x$ | Press to perform an arithmetic operation on the value displayed.<br>You must enter a number after the arithmetic operator.<br>If you press more than one arithmetic operator in sequence, the calculator only performs the last operation (the last key pressed). |

| | | |
|---|---|---|
| | 4 X ÷ + − + 5 | 9. |

## Equals

| | |
|---|---|
| = | Press to complete your calculation and display a result. If you press = more than once without entering a number, the calculator performs the last arithmetic operation on the value displayed. |

| | | |
|---|---|---|
| 4×8 | 4 X 8 = | 32. |
| | 4 X 8 = = | 256. |

## Making corrections

| | |
|---|---|
| ← | Press to delete the last number entered. |
| C/CE | Press to remove the displayed value, but retain the calculation being performed.<br>Press after the arithmetic operator to cancel the entire calculation. |

| | |
|---|---|
| 5 + 5 + 5 + 6 C/CE 5 = | 20. |
| 5 + 5 + 5 + C/CE = | 0. |

## Clearing errors

| | |
|---|---|
| C/CE | Press to clear an error (indicated by "-E-" in the display)—eg, an overflow error—and retain data in the memory. |
| AC | Press to reset the calculator and clear the memory (solar model only). |

## Fixing the number of decimal places displayed

| | |
|---|---|
| INV FIX 2 | Press after your arithmetic operation, or after you press AC, to set the number of decimal places displayed (the number you press is the number of decimal places you want to display). The calculator rounds the number in the display but maintains full precision internally. |
| INV FIX • | Press to reset the floating decimal point. |

## Setting the display to scientific notation

| | |
|---|---|
| INV SCI | Press to set the display to scientific notation and express the number as a power of 10—eg, .0043 is displayed as $4.3.^{-03}$ to represent $4.3\times10^{-3}$. |
| INV FLO | Press to reset the display to the floating format. |

# 4. Calculations

## Precision

The HP 6S scientific calculator calculates answers to 12-digit accuracy, but rounds answers to 10 digits in the display. When it performs a calculation using the result of a previous calculation, it uses the stored 12-digit value and not the 10-digit value displayed.

## Order of operations

The HP 6S scientific calculator performs operations in the following order:

$x^2$, $\sqrt[x]{y}$, R→P, P→R
×, ÷
+, −
AND
OR, XOR, XNOR

## Simple calculations

Perform calculations in the same way that you write them on paper.

7.2×8.5 – 4.7×3.9

7 • 2 × 8 • 5 − 4 • 7 × 3 • 9 = 42.87

4×8 4 × 8 = 32.

## Specifying the order of calculations

( )

Use brackets to specify the order of calculations. You can nest as many as six levels of brackets.
You do not need to enter the closing brackets. The calculator inserts them for you, although it does not display them.

-5(4+3) 5 +/− × ( 4 + 3 = -35.

## Re-using arithmetic operations

[+][+]
or
[X][X]
etc

Press the arithmetic operator key twice to re-use an arithmetic operation on a new number. The calculator stores the operation and applies it when you enter another number and press [=].
Store a calculation for re-use by enclosing it in brackets.
Clear the stored arithmetic operation by pressing [C/CE].

| | | |
|---|---|---|
| 3+2.3 | [3][+][+][2][•][3][=] | 5.3 |
| 6+2.3 | [6][=] | 8.3 |
| 9+2.3 | [9][=] | 11.3 |
| 4(3×6) | [4][X][X][(][3][X][6][=] | 72. |
| -5(3×6) | [5][+/−][=] | -90. |

## Using memory

[X→M]
[M+]
[RM]
[X↔M]
[C/CE]
[AC]
[OFF]
[ON]

The HP 6S scientific calculator has one independent memory.
**M** is displayed when there is a value in memory.
Press [C/CE] to clear the display or cancel the current calculation without clearing the memory.
Press [X→M] to store the displayed value in memory.
Press [M+] to add the displayed value to the memory.
Press [RM] to retrieve the contents of memory—to determine its value or include it in your calculation.
Press [INV] [X↔M] to display the contents of memory and replace it with the value that was displayed before the keys were pressed.
Press [AC] to clear the display and the memory (solar model).
Press [OFF] [ON] to clear the display and the memory (battery model).

## Fraction arithmetic

[$\frac{a}{b}$]

Press to enter fractions.
Press [$\frac{a}{b}$] after [=] to display the fraction as a decimal.
In the display, a fraction is reduced to its lowest terms when you press a function command key (×,÷,+,-) or =.

$4\ 5/6 \times (3+1\ 2/3) \div 7\ 8/9$

[4][$\frac{a}{b}$][5][$\frac{a}{b}$][6][X][(][3][+][1][$\frac{a}{b}$][2][$\frac{a}{b}$][3][)][÷][7][$\frac{a}{b}$][8][$\frac{a}{b}$][9][=] → 2_61 ⌟71.
[$\frac{a}{b}$] → 2.86

$(1.5\times10^{7}) - [(2.5\times10^{6}) \times {}^{3}/_{100}] =$

| | |
|---|---|
| 1 • 5 Exp 7 − 2 • 5 Exp 6 × 3 A⅞ 1 0 0 = | 149250000. |

$3^{456}/_{78} = 8^{11}/_{13}$

| | |
|---|---|
| 3 A⅞ 4 5 6 A⅞ 7 8 | 3_456_78. |
| = | 8_11_13. |

INV D/C — Press these keys to switch between proper and improper fractions.

$8^{11}/_{13} = {}^{115}/_{13}$

| | |
|---|---|
| | 8_11_13. |
| INV D/C | 115_13. |
| INV D/C | 8_11_13. |

The answer to a calculation involving both fractions and decimals is displayed as a decimal.

$^{41}/_{52} \times 78.9$ — 4 1 A⅞ 5 2 × 7 8 • 9 = 62.20961538

## Percentage calculations

INV % — Press to perform percentage calculations.

| | | |
|---|---|---|
| 12% of 1500 | 1 5 0 0 × 1 2 INV % = | 180. |
| 660 as a percentage of 880 | 6 6 0 ÷ 8 8 0 INV % = | 75. |
| 2500 plus 15% | 2 5 0 0 + 1 5 INV % | 375. |
| | = | 2875. |
| 25% discount on 3500 | 3 5 0 0 − 2 5 INV % | 875. |
| | = | 2625. |

26% of 2200; 26% of 3300; 26% of 3800;

| | |
|---|---|
| 2 2 0 0 × × 2 6 INV % = | 572. |
| 3 3 0 0 = | 858. |
| 3 8 0 0 = | 988. |

$80 last week; $100 this week: what % is the new value of the old value?

| | |
|---|---|
| 1 0 0 ÷ 8 0 INV % = | 125. |

What % is 138gm to 150gm and 129gm to 150gm?

| | |
|---|---|
| 1 3 8 ÷ ÷ 1 5 0 INV % = | 92. |
| 1 2 9 = | 86. |

# 5. Other functions

## Converting minutes and seconds to decimal format

| | |
|---|---|
| →DEG | Press to convert minutes and seconds (sexagesimal figure) to decimal format. When you enter the sexagesimal figure, enter the degrees to the left of the decimal point, and minutes and seconds to the right—the first and second digits to the left of decimal point are minutes and the third and subsequent digits seconds. |
| INV →DMS | Press to convert decimal format to sexagesimal format. |

| | | |
|---|---|---|
| 14°25′36″ | 1 4 • 2 5 3 6 →DEG | 14.42666667 |
| INV →DMS | | 14°25′36″ |

## Conversion between angles, radians and grads

| | | | |
|---|---|---|---|
| INV DRG▸ | 45° = 0.785398163 rad = 50 grad | 4 5 INV DRG▸ | RAD 0.785398163 |
| | | INV DRG▸ | GRAD 50. |
| | | INV DRG▸ | DEG 45. |

## Trigonometric functions

Press DRG to switch between RAD, DEG and GRAD

| | | |
|---|---|---|
| sin (π/6 rad) = | RAD INV π ÷ 6 = sin | RAD 0.5 |
| cos 63°52′41″ = | DEG 6 3 • 5 2 4 1 →DEG | DEG 63.87805556 |
| | cos | DEG 0.440283084 |
| tan (-35 grad) = | GRAD 3 5 +/- tan | GRAD -0.612800788 |
| 2 • sin 45° x cos 65° = | DEG 2 x 4 5 sin x 6 5 cos = | DEG 0.597672477 |
| cot 30° = 1/tan 30° = | DEG 3 0 tan 1/x | DEG 1.732050808 |
| $\sec(\pi/3\text{ rad}) = \cos\frac{1}{(\pi/3\text{ rad})}$ | RAD INV π ÷ 3 = cos 1/x | RAD 2. |
| $\text{cosec } 30° = \frac{1}{\sin 30°}$ | 3 0 sin 1/x | DEG 2. |
| $\cos\frac{-\sqrt{2}}{2}$ | RAD 2 INV √ +/- ÷ 2 = cos | RAD 0.760244597 |
| $\tan^{-1}0.6104 =$ | DEG • 6 1 0 4 INV tan⁻¹ | DEG 31.39989118 |
| | INV →DMS | DEG 31°23′59.6″ |

## Hyperbolic functions

| | | |
|---|---|---|
| sinh 3.6 = | 3 • 6 HYP sin | 18.28545536 |
| tanh 2.5 = | 2 • 5 HYP tan | 0.986614298 |
| cosh 1.5 – sinh 1.5 = | 1 • 5 X→M HYP cos – | M 2.352409615 |
| | RM HYP sin = | M 0.22313016 |
| $\sinh^{-1} 30$ = | 3 0 INV HYP $\sin^{-1}$ | 4.094622224 |
| solve tanh 4x = 0.88<br>$x = \frac{\tan^{-1} 0.88}{4}$ = | • 8 8 INV HYP $\tan^{-1}$ ÷ 4 = | 0.343941914 |

## Logarithmic functions

| | | |
|---|---|---|
| log 1.23 (=$\log_{10}$ 1.23) = | 1 • 2 3 log | 0.089905111 |
| solve $4^x = 64$ $x = \frac{\log 64}{\log 4}$ | 6 4 log ÷ 4 log = | 3. |
| log 456 ÷ ln 456 = | 4 5 6 X→M log ÷ RM ln = | M 0.434294481 |
| $10^{0.4} + 5 \bullet e^{.3}$ = | • 4 INV $10^x$ + 5 × 3 +/– INV $e^x$ = | 2.760821773 |
| $5.6^{2.3}$ = | 5 • 6 $y^x$ 2 • 3 = | 52.58143837 |
| $123^1/_7$ ($=\sqrt[7]{123}$) = | 1 2 3 INV $\sqrt[x]{y}$ 7 = | 1.988647795 |
| $(78 - 23)^{-12}$ = | ( 7 8 – 2 3 ) $y^x$ 1 2 +/– = | $1.305111829^{-21}$ |
| $3^{12} + e^{10}$ = | 3 $y^x$ 1 2 + 1 0 INV $e^x$ = | 553467.4658 |

## Powers and roots

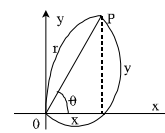
| | | |
|---|---|---|
| $\sqrt{2} + \sqrt{3} \times \sqrt{5}$ = | 2 INV √ + 3 INV √ × 5 INV √ = | 5.287196909 |
| $\sqrt[3]{5} + \sqrt[3]{-27}$ = | 5 INV $\sqrt[3]{}$ + 2 7 +/– INV $\sqrt[3]{}$ | -1.290024053 |
| $123 + 30^2$ = | 1 2 3 + 3 0 $x^2$ = | 1023. |
| 8! (=1 x 2 x 3 x … x 7 x 8 ) = | 8 INV $n!$ | 40320 |

## Miscellaneous functions

| | | |
|---|---|---|
| 1.234 + 1.234 = | INV FIX 2 1 • 2 3 4 + | 1.23 |
| | 1 • 2 3 4 = | 2.47 |
| | INV FIX • | 2.468 |
| 1 ÷ 3 + 1 ÷ 3 = | INV FIX 2 1 ÷ 3 + | 0.33 |
| | INV SCI | 3.33-01 |
| | 1 ÷ 3 = | 6.67-01 |
| | INV FLO | 0.67 |
| | INV FIX • | 0.666666666 |
| 123m x 456m = 56088m | 1 2 3 x 4 5 6 = | 56088. |
| = 56.088km | INV ENG | 56.088 03 |
| 7.8g ÷ 96 = 0.08125g | 7 • 8 ÷ 9 6 = | 0.08125 |
| = 81.25mg | INV ENG | 81.25 - 03 |

## Polar to rectangular coordinates conversions

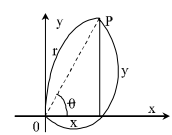
Formula: $x = r \bullet \cos\theta$ $y = r \bullet \sin\theta$
eg, find the value of x and y when the point P is shown as $\theta$=60 and the length r=2 in the polar coordinates




| | |
|---|---|
| DEG 2 INV X↔Y 6 0 INV P→R | 1. |
| | (x) |
| INV X↔Y | 1.732050808 |
| | (y) |
| INV X↔Y | 1. |
| | (x) |

## Rectangular to polar coordinates conversions

Formula: $r = \sqrt{x^2 + y^2}$
$\theta = \tan^{-1}{}^{y}/_{x}$ $(-180° < \theta \geq 180°)$
eg, find the length r and the angle $\theta$ in radian when the point P is shown as x=1 and y=$\sqrt{3}$ in the rectangular coordinates.




| | |
|---|---|
| RAD 1 INV X↔Y 3 INV √ R→P = | 2. |
| | (r) |
| INV X↔Y | 1.047197551 |
| | (θ in radian) |
| INV X↔Y | 2. |
| | (r) |

# 6. Binary, octal and hexadecimal values

MODE

HEX OCT
BIN DEC

Use the MODE key to set the number base. When you use bases other than 10, you can only enter numbers valid for the base—eg, in binary mode you can only enter 1 and 0.

MODE HEX sets the mode to hexadecimal. In hexadecimal mode, A to F keys are enabled. Note that b and d in hexadecimal mode are shown in lower case to distinguish them from numbers.

MODE OCT sets the mode to octal.

MODE BIN sets the mode to binary.

MODE DEC sets the mode to decimal.

**Note:** When using a number base other than 10, any fractional part is truncated.

## Binary/octal/decimal/hexadecimal conversions

Conversion of $22_{10}$ to binary. 2 2 MODE BIN → BIN 10110.

Conversion of $22_{10}$ to octal. MODE OCT → OCT 26.

Conversion of $513_{10}$ to binary. 5 1 3 MODE BIN → E BIN 0.

Conversion to binary mode generates an error if the result is greater than 10 digits.

Conversion of $7FFFFFFF_{16}$ to decimal.

MODE HEX 7 F F F F F F F MODE DEC → 2147483647.

Conversion of $123456_{10}$ to octal.

1 2 3 4 5 6 MODE OCT → OCT 361100.

Conversion of $1100110_2$ to decimal.

MODE BIN 1 1 0 0 1 1 0 MODE DEC → 102.

## Binary/octal/decimal/hexadecimal calculations

MODE

HEX OCT

BIN DEC

$10111_2 + 11010_2 = 110001_2$

MODE BIN 1 0 1 1 + 1 1 0 1 = → BIN 11000.

$123_8 \times ABC_{16}$

$= 37AF4_{16}$ MODE OCT 1 2 3 × MODE HEX A B C = → HEX 37AF4.

$= 228084_{10}$ MODE DEC → 228084.

$1F2D_{16} - 100_{10}$

$= 7881_{10}$ MODE HEX 1 F 2 D − MODE DEC 1 0 0 → 7881.

$= 1EC9_{16}$ MODE HEX = → HEX 1EC9.

$7654_8 \div 12_{10}$

$= 334.33\ldots_{10}$ MODE OCT 7 6 5 4 ÷ MODE DEC 1 2 = | 334.3333333

$= 516_8$ MODE OCT | OCT 516.

Fractional parts of calculation results are truncated.

$110_2+456_8 \times 78_{10} \div 1A_{16}$ MODE BIN 1 1 0 + MODE OCT 4 5 6 X

$=390_{16}$ MODE DEC 7 8 ÷ MODE HEX 1 A = | HEX 390.

$=912_{10}$ MODE DEC | 912.

Multiplication and division are given priority over addition and subtraction in mixed calculations.

$BC_{16} \times (14_{10} + 69_{10}$

$=15604_{10}$

$=3CF4_{16}$

MODE HEX B C X ( MODE DEC 1 4 + 6 9 ) = | 15604.

MODE HEX | HEX 3CF4.

## Logical operations

AND OR
XOR XNOR
NOT

You can use the following logical operations to compare two numbers. When performing logical operations, keep the following points in mind:

- You cannot use decimal-base numbers in logical operations.
- The calculator compares the binary versions of the numbers you enter. If the number is less than 10 digits long, the calculator fills values to the left of the number with 0s—eg, if you compare hexadecimal F1 to octal 4, the calculator compares 0000010001 to 0000000100.
- If you use one number with a logical operation, the calculator compares it to 0000000000.

The logical operators work in the following way:

1. The operation compares the binary digits in the corresponding positions in each of the numbers.
2. The operation returns a binary digit corresponding to each position.
3. If you are using a base other than binary, the result is shown in the base of the last number you entered.

The following logical operators are available:

AND returns a 1 for every position where there is a 1 in both numbers.
OR returns a 1 for every position where there is a 1 in either number.
XOR returns a 1 for every position where there is a 1 in either number, but not both numbers.
XNOR returns a 1 for every position where there is the same digit in both numbers.
NOT returns the diminished radix complement.

Press these keys to perform the respective binary, octal, decimal and hexadecimal logical operations.

$19_{16}$AND $1A_{16} = 18_{16}$

[MODE] [HEX] [1] [9] [AND] [1] [A] [=] → HEX 18.

$120_{16}$OR $1101_2 = 12D_{16}$

[MODE] [HEX] [1] [2] [0] [OR] [MODE] [BIN] [1] [1] [0] [1] [=] → BIN 100101101.

[MODE] [HEX] → HEX 12d.

$5_{16}$XOR $3_{16} = 6_{16}$

[MODE] [HEX] [5] [XNOR] [3] [=] → HEX 6.

$2A_{16}$XNOR $5D_{16} = FFFFFFFF88_{16}$

[MODE] [HEX] [2] [A] [XNOR] [5] [D] [=] → HEX FFFFFFFF88.

$1A_{16}$ AND $2F_{16} = A_{16}$

[MODE] [HEX] [1] [A] [AND] [AND] [2] [F] [=] → HEX A.

NOT of $1010_2$

[MODE] [BIN] [1] [0] [1] [1] [0] [NOT] → BIN 1111101001.

## Radix complement

| | |
|---|---|
| [INV] [NEG] | Press to calculate and display the radix complement of the hexadecimal, octal or binary number currently displayed—ie, 10000000000-the binary version of the number. |

# 7. Using statistics

| | |
|---|---|
| MODE SD | Press to use statistics mode. Statistics mode allows you to enter data and apply the statistics functions to analyse the data. |

## Entering a list of data items to analyse

| | |
|---|---|
| DATA | Press after each data element. When you press DATA, the calculator displays the number of data elements entered.<br>For example, to enter a list of data consisting of 5, 8 and -3, use the following keystrokes:<br>5 DATA 8 DATA 3 +/– DATA<br>To enter the results of a calculation as a data item, perform the calculation as you would normally, then press DATA when the answer is displayed.<br>You can amend the data entered into the calculator:<br>To cancel the last entry you made, press C/CE before you press DATA. Note that when you press C/CE, **0** is displayed. Press INV $n$ to display the number of data elements stored in the calculator. To delete a data item you entered previously, enter the value again, then press INV DEL. |

## Using statistical functions on your data

| | | |
|---|---|---|
| INV $n$<br>$\sigma n$-1 $\sigma n$<br>$\bar{x}$ $\Sigma x$<br>$\Sigma x^2$ | Once you enter a list of data values you can use the following statistical functions: | |
| | INV $n$ | The number of data elements entered |
| | INV $\sigma n$-1 | Sample standard deviation |
| | INV $\sigma n$ | Population standard deviation |
| | INV $\bar{x}$ | Arithmetic mean |
| | INV $\Sigma x$ | The sum of each data element |
| | INV $\Sigma x^2$ | The sum of the data elements squared |

DATA

Find the sample standard deviation of the data 5, 9 13 and 6.

MODE SD 5 DATA 9 DATA 1 3 DATA 6 DATA INV $\sigma n$-1 | SD 3.593976442

4, 1, 82, 59, 2, and 103 were entered, but 59 was entered by mistake. It should have been 58. To fix the mistake, enter the wrong number, 59, and INV DEL, then enter the right number, 58, and DATA.

# 8. Specifications

## Scientific functions/input range

| | |
|---|---|
| sinx / cosx / tanx | $\|x\|<4.5\times10^{10}$ degrees<br>($<25\times10^{7}\pi$rad,$<5\times10^{10}$grad |
| $\sin^{-1}x$ / $\cos^{-1}x$ | $\|x\|\geq1$ |
| $\tan^{-1}x$ | $\|x\|<10^{100}$ |
| sinhx / coshx | $\|x\|\geq230.2585092$ |
| tanhx | $\|x\|<10^{100}$ |
| $\sinh^{-1}x$ | $\|x\|<5\times10^{99}$ |
| $\cosh^{-1}x$ | $\|x\|\geq x<5\times10^{99}$ |
| $\tanh^{-1}x$ | $\|x\|<1$ |
| logx / lnx | $10^{-99}\geq x<10^{100}$ |
| $e^x$ | $-10^{100}<x\geq230.2585092$ |
| $10^x$ | $-10^{100}<x<100$ |
| $y^x$ | $y>0\rightarrow10^{100}<x\bullet\log y<100$<br>$y=0\rightarrow x>0$<br>$y<0\rightarrow$x : integer or $1/2n+1$ (n : integer) |
| $\sqrt[x]{y}$ | $y>0\rightarrow x\neq0$ : $-10^{100}<1/x\bullet\log y<230.2582092$<br>$y=0\rightarrow x>0$<br>$y<0\rightarrow$x : odd number or $1/n$ (n : integer) |
| $\sqrt{x}$ | $0\geq x<10^{100}$ |
| $x^2$ | $\|x\|<10^{50}$ |
| $\sqrt[3]{x}$ | $\|x\|<10^{100}$ |
| $1/x$ | $\|x\|<10^{100}(x\neq o)$ |
| n! | $0\geq x<69$ (x: integer) |
| REC→POL | $\sqrt{x^2+y^2}<10^{100}$ |
| POL→REC | $\|\theta\|<4.5\times10^{10}$ degrees<br>($<25\times10^{7}$rad, $<5\times10^{10}$grad)<br>$0\geq r\geq10^{100}$ |
| DMS→DEG | $\|x\|\geq10^{100}$ |
| DEG→DMS | $\|x\|\geq10^{7}$ |
| π | 10 digits |
| Binary | Positive: 0≥x≥1111111111<br>Negative: 1000000000≥x≥1111111111 |
| Octal | Positive: 0≥x≥3777777777<br>Negative: 4000000000≥x≥7777777777 |
| Decimal | Positive: 0≥x≥9999999999<br>Negative: -9999999999≥x<0 |
| Hexadecimal | Positive: 0≥x≥2540BE3FF<br>Negative: FDABF41C01≥x≥FFFFFFFFFF |

**Read-out**

- Liquid crystal display suppressing unnecessary 0s (zeros).

**Power source**

- Silicon solar cell (solar model only)
- Alkaline manganese battery (LR43)—1 battery for the solar model; 2 batteries for the non-solar model.

**Ambient Temperature range**

- 0°C–40°C (32°F–104°F).

**Dimensions**

- 127mmH x 72mmW x 8.5mmD (not including the wallet).

**Net weight**

91g (including wallet).

# 9. Changing the battery

- **Replace the battery when:**

  Replace the battery (alkaline manganese battery (LR43)—1 in the solar model and 2 in the non-solar model) when the display darkens under poor light condition, or disappears, and cannot be restored by pressing AC.

- **To replace the battery:**

  1. Remove the four screws at the back of the calculator. **Don't loose the screws**.
  2. Remove the back panel.
  3. Remove the old battery. Lever it out with a sharp object like a pen.
  4. Install the new battery with the + sign at the uppermost.
  5. Replace the back panel and the screws.
  6. Check the display to make sure it is showing **0** in DEG mode.