

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.

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1. Keyboard

General keys

Key	Functions	Page
\square to \square : \square	Data entry	8
\square \square \square \square	Basic calculation	8
\square	Reset the calculator and clear the memory	9
\square / \square	Clear/clear error	9
\square / \square	Change sign	8

Memory keys

Key	Functions	Page
\square	Retrieve data from the independent memory	11
\square \square	Store display data in memory	11
\square \square	Exchange of display data and contents of memory	11
\square \square	Add displayed data to memory	11

Special keys

Key	Functions	Page
\square	Inverse	7
\square	Mode	7
\square \square	Brackets (parentheses)	10
\square . \square	Exponent	8
\square	Pi	13

Key	Functions	Page
\square - \square \square - \square	Sexagesimal/decimal notation conversion	13
\square	Mode of angle DEG→RAD→GRAD→DEG	13
\square	Angular conversion of data DEG→RAD→GRAD→DEG	13
\square ↔ \square	Register exchange	11
\square	Clearing the last entered digit	9
\square	Fix the number of digits after the decimal point	9
\square	Floating notation	9
\square	Scientific notation	9
\square	Engineering notation	15

Base-n keys

Key	Functions	Page
\square	Decimal	16
\square	Binary	16
\square	Hexadecimal	16
\square	Octal	16
\square to \square	Hexadecimal numbers only	16–18
\square	And	17
\square	Or	17
\square	Exclusive Or	17
\square	Exclusive Nor	17
\square	Not	17
\square	Negative	18

Function keys

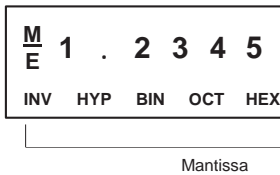
Key	Functions	Page
\sin	Sine	13
\cos	Cosine	13
\tan	Tangent	13
\sin^{-1}	Arc sine	13
\cos^{-1}	Arc cosine	13
\tan^{-1}	Arc tangent	13
HYP	Hyperbolic	14
\log	Common logarithm	14
10^x	Common antilogarithm	14
\ln	Natural logarithm	14
e^x	Natural antilogarithm	14
$\sqrt{\quad}$	Square root	14
x^2	Square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

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

Statistical keys

Key	Functions	Page
SD	Statistical data mode	19
DATA	Data entry	19
DEL	Data delete	19
σ_n	Sample standard deviation	19
σ_{n-1}	Population standard deviation	19
\bar{x}	Arithmetic mean	19
n	Number of data	19
$\sum x$	Sum of value	19
$\sum x^2$	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	$\boxed{\text{INV}}$ has been pressed to enable inverse key functions	9
M	Indicates that data is stored in the memory	11
HYP	$\boxed{\text{HYP}}$ 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	$\boxed{\text{DRG}}$ 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^{12}_{123}	11
12.°3'45.6"	Sexagesimal figure $12^{\circ}3'45.6''$	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



Press the number keys to enter numbers.
Press \cdot for a decimal point.

Entering negative numbers



Press after a number to make it negative.

$5 \cdot 0 8 +/-$

-5.08

Entering exponential numbers



Press to enter an exponential number.

3.08×10^9

$3 \cdot 0 8 \text{Exp} 9$

3.08^{09}

Arithmetic operator



Press to perform an arithmetic operation on the value displayed.

You must enter a number after the arithmetic operator.

If you press more than one arithmetic operator in sequence, the calculator only performs the last operation (the last key pressed).

$4 \times + + - + 5$

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

$4 \times 8 =$

32.

$4 \times 8 = =$

256.

Making corrections



Press to delete the last number entered.

Press to remove the displayed value, but retain the calculation being performed.

Press after the arithmetic operator to cancel the entire calculation.

$5 + 5 + 5 + 6 \text{ C/CE } 5 =$

20.

$5 + 5 + 5 + \text{C/CE} =$

0.

Clearing errors




Press to clear an error (indicated by “-E-” in the display)—eg, an overflow error—and retain data in the memory.



Press to reset the calculator and clear the memory (solar model only).

Fixing the number of decimal places displayed



Press after your arithmetic operation, or after you press , 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.



Press to reset the floating decimal point.

Setting the display to scientific notation



Press to set the display to scientific notation and express the number as a power of 10—eg, .0043 is displayed as $4.3 \cdot 10^{-3}$ to represent 4.3×10^{-3} .



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

Simple calculations

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

$$7.2 \times 8.5 - 4.7 \times 3.9$$

$$7 \cdot 2 \times 8 \cdot 5 - 4 \cdot 7 \times 3 \cdot 9 =$$

42.87

$$4 \times 8$$

$$4 \times 8 =$$

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.

$$-5(4+3)$$

$$5 +/ - \times (4 + 3) =$$

-35.

Re-using arithmetic operations

$\boxed{+} \boxed{+}$

or

$\boxed{\times} \boxed{\times}$

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 $\boxed{=}$.
 Store a calculation for re-use by enclosing it in brackets.
 Clear the stored arithmetic operation by pressing $\boxed{C/CE}$.

3+2.3	$\boxed{3} \boxed{+} \boxed{+} \boxed{2} \boxed{\cdot} \boxed{3} \boxed{=}$	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">5.3</div>
6+2.3	$\boxed{6} \boxed{=}$	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">8.3</div>
9+2.3	$\boxed{9} \boxed{=}$	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">11.3</div>
4(3×6)	$\boxed{4} \boxed{\times} \boxed{\times} \boxed{(} \boxed{3} \boxed{\times} \boxed{6} \boxed{=}$	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">72.</div>
-5(3×6)	$\boxed{5} \boxed{+/-} \boxed{=}$	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">-90.</div>

Using memory

$\boxed{X\rightarrow M}$

$\boxed{M+}$

\boxed{RM}

$\boxed{X\rightarrow M}$

$\boxed{C/CE}$

\boxed{AC}

\boxed{OFF}

\boxed{ON}

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

Fraction arithmetic

$\boxed{A/B}$

Press to enter fractions.
 Press $\boxed{A/B}$ after $\boxed{=}$ 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 ($\times, \div, +, -$) or $\boxed{=}$.

$$4 \frac{5}{6} \times (3 + 12/3) \div 7 \frac{8}{9}$$

$\boxed{4} \boxed{A/B} \boxed{5} \boxed{A/B} \boxed{6} \boxed{\times} \boxed{(} \boxed{3} \boxed{+} \boxed{1} \boxed{2} \boxed{A/B} \boxed{3} \boxed{)} \boxed{\div} \boxed{7} \boxed{A/B} \boxed{8} \boxed{A/B} \boxed{9} \boxed{=}$ 2_61_71.

$\boxed{A/B}$ 2.86

$$(1.5 \times 10^7) - [(2.5 \times 10^6) \times \frac{3}{100}] =$$

$$\boxed{1} \boxed{\cdot} \boxed{5} \boxed{\text{Exp}} \boxed{7} \boxed{-} \boxed{2} \boxed{\cdot} \boxed{5} \boxed{\text{Exp}} \boxed{6} \boxed{\times} \boxed{3} \boxed{\text{Ans}} \boxed{1} \boxed{0} \boxed{0} \boxed{=} \boxed{149250000.}$$

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

$$\boxed{3} \boxed{\text{Ans}} \boxed{4} \boxed{5} \boxed{6} \boxed{\text{Ans}} \boxed{7} \boxed{8} \boxed{=} \boxed{3_456_178.}$$

$$\boxed{=} \boxed{8_11_13.}$$

INV D/C

Press these keys to switch between proper and improper fractions.

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

$$\boxed{8_11_13.}$$

$$\boxed{\text{INV}} \boxed{\text{D/C}} \boxed{=} \boxed{115_13.}$$

$$\boxed{\text{INV}} \boxed{\text{D/C}} \boxed{=} \boxed{8_11_13.}$$

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

$$4^{1/52} \times 78.9$$

$$\boxed{4} \boxed{1} \boxed{\text{Ans}} \boxed{5} \boxed{2} \boxed{\times} \boxed{7} \boxed{8} \boxed{\cdot} \boxed{9} \boxed{=} \boxed{62.20961538}$$

Percentage calculations

INV %

Press to perform percentage calculations.

$$12\% \text{ of } 1500$$

$$\boxed{1} \boxed{5} \boxed{0} \boxed{0} \boxed{\times} \boxed{1} \boxed{2} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{180.}$$

$$660 \text{ as a percentage of } 880$$

$$\boxed{6} \boxed{6} \boxed{0} \boxed{\div} \boxed{8} \boxed{8} \boxed{0} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{75.}$$

$$2500 \text{ plus } 15\%$$

$$\boxed{2} \boxed{5} \boxed{0} \boxed{0} \boxed{+} \boxed{1} \boxed{5} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{375.}$$

$$\boxed{=} \boxed{2875.}$$

$$25\% \text{ discount on } 3500$$

$$\boxed{3} \boxed{5} \boxed{0} \boxed{0} \boxed{-} \boxed{2} \boxed{5} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{875.}$$

$$\boxed{=} \boxed{2625.}$$

$$26\% \text{ of } 2200; 26\% \text{ of } 3300; 26\% \text{ of } 3800;$$

$$\boxed{2} \boxed{2} \boxed{0} \boxed{0} \boxed{\times} \boxed{2} \boxed{6} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{572.}$$

$$\boxed{3} \boxed{3} \boxed{0} \boxed{0} \boxed{=} \boxed{858.}$$

$$\boxed{3} \boxed{8} \boxed{0} \boxed{0} \boxed{=} \boxed{988.}$$

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

$$\boxed{1} \boxed{0} \boxed{0} \boxed{\div} \boxed{8} \boxed{0} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{125.}$$

$$\text{What \% is } 138\text{gm to } 150\text{gm and } 129\text{gm to } 150\text{gm?}$$

$$\boxed{1} \boxed{3} \boxed{8} \boxed{\div} \boxed{1} \boxed{5} \boxed{0} \boxed{\text{INV}} \boxed{\%} \boxed{=} \boxed{92.}$$

$$\boxed{1} \boxed{2} \boxed{9} \boxed{=} \boxed{86.}$$

5. Other functions

Converting minutes and seconds to decimal format

\square -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.

\square (INV) \square -DMS

Press to convert decimal format to sexagesimal format.

14°25'36"

\square 1 \square 4 \square • \square 2 \square 5 \square 3 \square 6 \square +DEG

14.42666667

\square (INV) \square -DMS

14°25'36"

Conversion between angles, radians and grads

\square (INV) \square DRG \square

45° = 0.785398163 rad = 50 grad

\square 4 \square 5 \square (INV) \square DRG \square

RAD 0.785398163

\square (INV) \square DRG \square

GRAD 50.

\square (INV) \square DRG \square

DEG 45.

Trigonometric functions

Press \square DRG \square
to switch
between
RAD, DEG
and GRAD

$\sin(\pi/6 \text{ rad}) =$

RAD \square (INV) \square π \square \div \square 6 \square = \square sin \square

RAD 0.5

$\cos 63^\circ 52' 41'' =$

DEG \square 6 \square 3 \square • \square 5 \square 2 \square 4 \square 1 \square +DEG

DEG 63.87805556

\square COS \square

DEG 0.440283084

$\tan(-35 \text{ grad}) =$

GRAD \square 3 \square 5 \square +/ \square - \square tan \square

GRAD -0.612800788

$2 \cdot \sin 45^\circ \times \cos 65^\circ =$ DEG \square 2 \square × \square 4 \square 5 \square sin \square × \square 6 \square 5 \square cos \square = \square DEG 0.597672477

$\cot 30^\circ = 1/\tan 30^\circ =$

DEG \square 3 \square 0 \square tan \square \square \square \square

DEG 1.732050808

$\sec(\pi/3 \text{ rad}) = \cos \frac{1}{\pi/3 \text{ rad}}$

RAD \square (INV) \square π \square \div \square 3 \square = \square cos \square \square \square

RAD 2.

$\operatorname{cosec} 30^\circ = \frac{1}{\sin 30^\circ}$

\square 3 \square 0 \square sin \square \square \square \square

DEG 2.

$\cos \frac{-\sqrt{2}}{2}$

RAD \square 2 \square (INV) \square \square +/ \square - \square \div \square 2 \square = \square cos \square

RAD 0.760244597

$\tan^{-1} 0.6104 =$

DEG \square • \square 6 \square 1 \square 0 \square 4 \square (INV) \square tan \square \square \square

DEG 31.39989118

\square (INV) \square -DMS

DEG 31°23'59.6"

Hyperbolic functions

$$\sinh 3.6 = \boxed{3} \boxed{\cdot} \boxed{6} \boxed{\text{HYP}} \boxed{\sin} = \boxed{18.28545536}$$

$$\tanh 2.5 = \boxed{2} \boxed{\cdot} \boxed{5} \boxed{\text{HYP}} \boxed{\tan} = \boxed{0.986614298}$$

$$\cosh 1.5 - \sinh 1.5 = \boxed{1} \boxed{\cdot} \boxed{5} \boxed{\text{X}\cdot\text{M}} \boxed{\text{HYP}} \boxed{\cos} \boxed{-} = \boxed{2.352409615}^{\text{M}}$$

$$\boxed{\text{RM}} \boxed{\text{HYP}} \boxed{\sin} \boxed{=} = \boxed{0.22313016}^{\text{M}}$$

$$\sinh^{-1} 30 = \boxed{3} \boxed{0} \boxed{\text{INV}} \boxed{\text{HYP}} \boxed{\sin} \boxed{=} = \boxed{4.094622224}$$

$$\text{solve } \tanh 4x = 0.88$$

$$x = \frac{\tanh^{-1} 0.88}{4} = \boxed{0.8} \boxed{8} \boxed{\text{INV}} \boxed{\text{HYP}} \boxed{\tan} \boxed{=} \boxed{=} \boxed{4} \boxed{=} = \boxed{0.343941914}$$

Logarithmic functions

$$\log 1.23 (= \log_{10} 1.23) = \boxed{1} \boxed{\cdot} \boxed{2} \boxed{3} \boxed{\log} = \boxed{0.089905111}$$

$$\text{solve } 4^x = 64 \quad \log 64$$

$$x = \log^4 = \boxed{6} \boxed{4} \boxed{\log} \boxed{\div} \boxed{4} \boxed{\log} \boxed{=} = \boxed{3.}$$

$$\log 456 \div \ln 456 = \boxed{4} \boxed{5} \boxed{6} \boxed{\text{X}\cdot\text{M}} \boxed{\log} \boxed{\div} \boxed{\text{RM}} \boxed{\ln} \boxed{=} = \boxed{0.434294481}^{\text{M}}$$

$$10^{0.4} + 5 \cdot e^{-.3} = \boxed{0} \boxed{4} \boxed{\text{INV}} \boxed{10^x} \boxed{+} \boxed{5} \boxed{\text{X}} \boxed{3} \boxed{+/-} \boxed{\text{INV}} \boxed{e^x} \boxed{=} = \boxed{2.760821773}$$

$$5.6^{2.3} = \boxed{5} \boxed{\cdot} \boxed{6} \boxed{y^x} \boxed{2} \boxed{\cdot} \boxed{3} \boxed{=} = \boxed{52.58143837}$$

$$123^{1/7} (= \sqrt[7]{123}) = \boxed{1} \boxed{2} \boxed{3} \boxed{\text{INV}} \boxed{x\sqrt{y}} \boxed{7} \boxed{=} = \boxed{1.988647795}$$

$$(78 - 23)^{-12} = \boxed{(} \boxed{7} \boxed{8} \boxed{-} \boxed{2} \boxed{3} \boxed{)} \boxed{y^x} \boxed{1} \boxed{2} \boxed{+/-} \boxed{=} = \boxed{1.305111829}^{21}$$

$$3^{12} + e^{10} = \boxed{3} \boxed{y^x} \boxed{1} \boxed{2} \boxed{+} \boxed{1} \boxed{0} \boxed{\text{INV}} \boxed{e^x} \boxed{=} = \boxed{553467.4658}$$

Powers and roots

$$\sqrt{2} + \sqrt{3} \times \sqrt{5} = \boxed{2} \boxed{\text{INV}} \boxed{\sqrt{}} \boxed{+} \boxed{3} \boxed{\text{INV}} \boxed{\sqrt{}} \boxed{\text{X}} \boxed{5} \boxed{\text{INV}} \boxed{\sqrt{}} \boxed{=} = \boxed{5.287196909}$$

$$\sqrt[3]{5} + \sqrt[3]{-27} = \boxed{5} \boxed{\text{INV}} \boxed{\sqrt[3]{}} \boxed{+} \boxed{2} \boxed{7} \boxed{+/-} \boxed{\text{INV}} \boxed{\sqrt[3]{}} \boxed{=} = \boxed{-1.290024053}$$

$$123 + 30^2 = \boxed{1} \boxed{2} \boxed{3} \boxed{+} \boxed{3} \boxed{0} \boxed{x^2} \boxed{=} = \boxed{1023.}$$

$$8! (= 1 \times 2 \times 3 \times \dots \times 7 \times 8) = \boxed{8} \boxed{\text{INV}} \boxed{n!} = \boxed{40320}$$

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

$$1 \div 3 + 1 \div 3 =$$

INV FIX 2 1 ÷ 3 +	0.33
INV SCI	3.33-01
1 ÷ 3 =	6.67-01
INV FLO	0.67
INV FIX •	0.66666666

$$123\text{m} \times 456\text{m} = 56088\text{m}$$

$$= 56.088\text{km}$$

1 2 3 X 4 5 6 =	56088.
INV ENG	56.088 03

$$7.8\text{g} \div 96 = 0.08125\text{g}$$

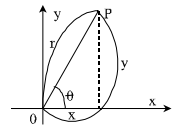
$$= 81.25\text{mg}$$

7 • 8 ÷ 9 6 =	0.08125
INV ENG	81.25 - 03

Polar to rectangular coordinates conversions

$$\text{Formula: } x = r \cdot \cos\theta \quad y = r \cdot \sin\theta$$

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



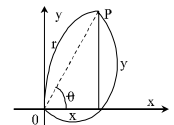
DEG 2 INV X-Y 6 0 INV P-R	1.
	(x)
INV X-Y	1.732050808
	(y)
INV X-Y	1.
	(x)

Rectangular to polar coordinates conversions

$$\text{Formula: } r = \sqrt{x^2 + y^2}$$

$$\theta = \tan^{-1} \frac{y}{x} \quad (-180^\circ < \theta \leq 180^\circ)$$

eg, find the length r and the angle θ 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** **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

$10111_2 + 11010_2 = 110001_2$

HEX **OCT**

MODE **BIN** **1** **0** **1** **1** **+** **1** **1** **0** **1** **=**

BIN 11000.

BIN **DEC**

$123_8 \times ABC_{16}$

$= 37AF4_{16}$

$= 228084_{10}$

MODE **OCT** **1** **2** **3** **X** **MODE** **HEX** **A** **B** **C** **=**

HEX 37AF4.

MODE **DEC**

228084.

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

$= 7881_{10}$

$= 1EC9_{16}$

MODE **HEX** **1** **F** **2** **D** **-** **MODE** **DEC** **1** **0** **0**

7881.

MODE **HEX** **=**

HEX 1EC9.

$$7654_8 \div 12_{10}$$

$$= 334.33\dots_{10}$$

$$= 516_8$$

(MODE) (OCT) (7) (6) (5) (4) (÷) (MODE) (DEC) (1) (2) (=) 334.3333333
(MODE) (OCT) OCT 516.

Fractional parts of calculation results are truncated.

$$110_2 + 456_8 \times 78_{10} \div 1A_{16}$$

$$= 390_{16}$$

$$= 912_{10}$$

(MODE) (BIN) (1) (1) (0) (+) (MODE) (OCT) (4) (5) (6) (X)
(MODE) (DEC) (7) (8) (÷) (MODE) (HEX) (1) (A) (=) HEX 390.
(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.

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

MODE HEX 1 9 AND 1 A = HEX 18.

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

MODE HEX 1 2 0 OR MODE BIN 1 1 0 1 = BIN 100101101.
MODE HEX HEX 12d.

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

MODE HEX 5 XOR 3 = HEX 6.

$$2A_{16} \text{ XNOR } 5D_{16} = \text{FFFFFFFF}88_{16}$$

MODE HEX 2 A XNOR 5 D = HEX FFFFFFFF88.

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

MODE HEX 1 A AND AND 2 F = HEX A.

$$\text{NOT of } 1010_2$$

MODE BIN 1 0 1 1 0 NOT BIN 111101001.

Radix complement

INV NEG

Press to calculate and display the radix complement of the hexadecimal, octal or binary number currently displayed—ie, 1000000000—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.

For example, to enter a list of data consisting of 5, 8 and -3, use the following keystrokes:

5 **DATA** **8** **DATA** **3** **+/-** **DATA**

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.

You can amend the data entered into the calculator.

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**

σ_{n-1} **σ_n**

\bar{x} **Σx**

Σx²

Once you enter a list of data values you can use the following statistical functions:

INV **n** The number of data elements entered

INV **σ_{n-1}** Sample standard deviation

INV **σ_n** Population standard deviation

INV **\bar{x}** Arithmetic mean

INV **Σx** The sum of each data element

INV **Σx²** 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** **13** **DATA** **6** **DATA** **INV** **σ_{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

$\sin x / \cos x / \tan x$	$ x < 4.5 \times 10^{10}$ degrees ($< 25 \times 10^7 \pi$ rad, $< 5 \times 10^{10}$ grad)
$\sin^{-1} x / \cos^{-1} x$	$ x \geq 1$
$\tan^{-1} x$	$ x < 10^{100}$
$\sinh x / \cosh x$	$ x \geq 230.2585092$
$\tanh x$	$ x < 10^{100}$
$\sinh^{-1} x$	$ x < 5 \times 10^{99}$
$\cosh^{-1} x$	$ x \geq x < 5 \times 10^{99}$
$\tanh^{-1} x$	$ x < 1$
$\log x / \ln x$	$10^{-99} \geq x < 10^{100}$
e^x	$-10^{100} < x \geq 230.2585092$
10^x	$-10^{100} < x < 100$
y^x	$y > 0 \rightarrow 10^{100} < x \bullet \log y < 100$ $y = 0 \rightarrow x > 0$ $y < 0 \rightarrow x$: integer or $1/2n + 1$ (n : integer)
x^y	$y > 0 \rightarrow x \neq 0$: $-10^{100} < 1/x \bullet \log y < 230.2582092$ $y = 0 \rightarrow x > 0$ $y < 0 \rightarrow x$: 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 0)$
$n!$	$0 \geq x < 69$ (x: integer)
REC \rightarrow POL	$\sqrt{x^2 + y^2} < 10^{100}$
POL \rightarrow REC	$ \theta < 4.5 \times 10^{10}$ degrees ($< 25 \times 10^7$ rad, $< 5 \times 10^{10}$ grad) $0 \geq r \geq 10^{100}$
DMS \rightarrow DEG	$ x \geq 10^{100}$
DEG \rightarrow DMS	$ x \geq 10^7$
π	10 digits
Binary	Positive: $0 \geq x \geq 1111111111$ Negative: $1000000000 \geq x \geq -1111111111$
Octal	Positive: $0 \geq x \geq 3777777777$ Negative: $4000000000 \geq x \geq -7777777777$
Decimal	Positive: $0 \geq x \geq 9999999999$ Negative: $-9999999999 \geq x < 0$
Hexadecimal	Positive: $0 \geq x \geq 2540BE3FF$ Negative: $FDABF41C01 \geq x \geq -FFFFFFFF$

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 \overline{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.