



Shown Actual Size

HP-25

**University
Calculator
Center**®

HP-25

Manufacturer: Hewlett-Packard

Display: 10 digit LED; 8 digit mantissa, 2 digit exponent when in scientific notation

Power Source: AC/DC rechargeable

AC Source: 100-127/200-254 V, 50-60 Hz

DC Operating Time: 2-5 hours

Recharge Time: 6 hours

Weight: 6 ounces

Size: 5.1 x 2.7 x 1.2 inches

Warranty: one year

Carrying Case: padded with belt loop

Logic: reverse Polish notation

Constant: yes

Underflow: scientific notation, range 10^{99} to 10^{-99}

Decimal: full floating; 0-9 with round off

Special Functions: see following

Prefix Keys \boxed{f} \boxed{g} :

The prefix keys allow most keys to perform 3 functions. If a key is pressed, the function on the key is performed. If the gold \boxed{f} key is pressed first, the gold function above the key is performed; if the blue \boxed{g} key is pressed first, the blue function on the key is performed. **In all examples \boxed{f} will be represented by \blacksquare and \boxed{g} by \blacksquare .**

Display Modes \boxed{SST} \boxed{BST} \boxed{GTO} :

When the calculator is turned on, it will display 0.00 —fixed notation, 2 decimal positions. The mode may be changed as follows—full internal accuracy is always maintained.

- \blacksquare \boxed{SST} 4 0.0000 fixed mode, 4 decimals
- \blacksquare \boxed{BST} 4 0.0000 00 scientific notation, 4 decimals
- \blacksquare \boxed{GTO} 4 0.000000 00 engineering notation (exponent expressed in multiples of 10^3). In specifying engineering notation, the number pressed increases the normal (0.00) display by that number of digits.

Examples:

Equation:

$$((2 + 3) \times 6 - 4) \div 2 = 13$$

$$2 \boxed{ENTER} \uparrow 3 \boxed{+} 6 \boxed{\times} 4 \boxed{-} 2 \boxed{\div} 13$$

Stack Operations $\boxed{ENTER} \uparrow$ $\boxed{x \leftrightarrow y}$ $\boxed{R} \downarrow$:

Positions	1	2	3	4	5	6	7	8	9	10
T	0	0	0	0	0	1	1	1	1	3
Z	0	0	0	1	1	2	2	2	2	1
Y	0	1	1	2	2	3	3	4	4	2
X	1	1	2	2	3	3	4	3	4	4

Scientific Notation and Change Sign \boxed{EEX} \boxed{CHS} :

$$(-2 \times 10^{25}) \times (4 \times 10^{-10}) = -8 \times 10^{15}$$

$$2 \boxed{CHS} \boxed{EEX} 25 \boxed{ENTER} \uparrow 4 \boxed{EEX} 10 \boxed{CHS} \boxed{\times} -8.15$$

Constant Arithmetic:

To enter a constant, load the constant into all four stack registers by pressing the enter key three times. To compound one thousand by six percent use the following sequence.

$$1.06 \boxed{ENTER} \uparrow \boxed{ENTER} \uparrow \boxed{ENTER} \uparrow$$

$$1000 \boxed{\times} 1060.00 \boxed{\times} 1123.60 \boxed{\times} 1191.02 \boxed{\times} 1262.48$$

$$\boxed{\times} 1338.23 \dots$$

Memory Operations \boxed{STO} \boxed{RCL} \boxed{EEX} \boxed{REG} :

- \boxed{STO} 1 Stores displayed number in register R_1
- \boxed{RCL} 3 Recalls number in register R_3
- $\boxed{STO} \boxed{+}$ 4 Adds displayed number to register R_4 and stores total in register R_4
- $\boxed{STO} \boxed{\times}$ 6 Multiplies number in register R_6 by displayed number and stores result in register R_6

Similarly for $-$, \div ; registers R_0 - R_7 may be used for storage and register arithmetic.

Trigonometric Functions $\boxed{4}$ $\boxed{5}$ $\boxed{6}$:

$$\sin 45^\circ = .71 \quad 45 \blacksquare \boxed{4} .71$$

$$\arcsin .3 = 17.46^\circ \quad .3 \blacksquare \boxed{4} 17.46$$

Angular Mode \boxed{CHS} \boxed{EEX} \boxed{CLX} \boxed{DEG} \boxed{RAD} \boxed{GRD} :

The normal calculator mode is decimal degrees, however, decimal radians or decimal grads may be used. For the radian mode press \blacksquare \boxed{EEX} ; all entries will now be in radians until a change is made or the calculator is turned off.

Common and Natural Logs $\boxed{7}$ $\boxed{8}$ $\boxed{e^x}$ $\boxed{10^x}$:

$$50 \blacksquare \boxed{7} 3.91 \blacksquare \boxed{7} 50 \text{ natural log and antilog}$$

$$50 \blacksquare \boxed{8} 1.70 \blacksquare \boxed{8} 50 \text{ common log and antilog}$$

Statistical Calculations

- Summations** $\boxed{\Sigma+}$:
- Data is accumulated in several storage registers when using $\boxed{\Sigma+}$. $\boxed{\Sigma+}$ stores and totals both the X and Y stack registers as follows:
- R_3 number of entries
 - R_4 summation of y
 - R_5 summation of xy
 - R_6 summation of x^2
 - R_7 summation of x

Registers R_3 - R_7 should be cleared before using $\boxed{\Sigma+}$. If an incorrect data set has been entered, reenter the incorrect data set and press \blacksquare $\boxed{\Sigma+}$ to correct the entry.

Mean and Standard Deviation $\boxed{x \leftrightarrow y}$ $\boxed{R} \downarrow$:

After the data has been accumulated as described under summations, the mean and standard deviation can be determined as follows:

- \blacksquare $\boxed{x \leftrightarrow y}$ mean of x
- \blacksquare $\boxed{R} \downarrow$ standard deviation of x

Example:

Data Sets x,y: 2,4; 6,8; 9,9; 14,20

$$4 \boxed{ENTER} \uparrow 2 \boxed{\Sigma+} 1$$

$$8 \boxed{ENTER} \uparrow 6 \boxed{\Sigma+} 2$$

$$9 \boxed{ENTER} \uparrow 9 \boxed{\Sigma+} 3$$

$$20 \boxed{ENTER} \uparrow 14 \boxed{\Sigma+} 4$$

$$\blacksquare \boxed{x \leftrightarrow y} 7.75 \text{ mean of x}$$

$$\blacksquare \boxed{R} \downarrow 5.06 \text{ standard deviation of x}$$

Conversions $\boxed{0}$ $\boxed{9}$ $\boxed{H.MS}$ \boxed{H} \boxed{R} \boxed{P} :

Used to convert hours/minutes/seconds to decimal hours, or degrees/minutes/seconds to decimal degrees.

$$10.2516 \blacksquare \boxed{0} 10.42$$

$$10 \text{ hours/degrees } 25 \text{ minutes } 16 \text{ seconds} = 10.42 \text{ hours/degrees}$$

$$5.89 \blacksquare \boxed{0} 5.53$$

$$5.89 \text{ hours/degrees} = 5 \text{ hours/degrees } 53 \text{ minutes } 24 \text{ seconds}$$

To convert from polar to rectangular coordinates

$$\theta \boxed{ENTER} \uparrow r \blacksquare \boxed{9} \blacksquare \boxed{x \leftrightarrow y} y$$

To convert from rectangular to polar coordinates

$$y \boxed{ENTER} \uparrow x \blacksquare \boxed{9} \blacksquare \boxed{x \leftrightarrow y} \theta$$

Other Functions:

$$\boxed{3} \blacksquare \boxed{2} \boxed{ENTER} \uparrow 3 \blacksquare \boxed{3} 8 \quad 2^3 = 8$$

$$\boxed{R} \downarrow 8 \blacksquare \boxed{R} \downarrow .125 \quad 1/8 = .125$$

$$\boxed{x \leftrightarrow y} 50 \boxed{ENTER} \uparrow 5 \blacksquare \boxed{x \leftrightarrow y} 2.5 \quad 50 \times 5\% = 2.5$$

$$\boxed{2} \blacksquare \boxed{2} 2 \quad \sqrt{4} = 2$$

$$2 \blacksquare \boxed{2} 4 \quad 2^2 = 4$$

$$\boxed{\cdot} \blacksquare \boxed{\cdot} 3.14 \quad \pi = 3.14$$

$\boxed{\cdot}$ LAST x recalls last number displayed preceding last operation

$$\boxed{1} 124.56 \blacksquare \boxed{1} 124.00$$

$$124.56 \blacksquare \boxed{1} .56$$

Programming:

Up to 49 steps may be used in programming. To illustrate how programs can be written, the area of a circle will be programmed.

$$A = \pi r^2$$

Turn switch to PRGM.

	00	←	line number		
■				15	← key location
2	01	15	02		← merged key location
x^2				15	
■	02	15	73		
π					
X	03		61		

Turn switch to RUN.

Key **GTO** **0** **0** which resets program to beginning.

2	R/S	12.57
5	R/S	78.54
10	R/S	314.16

Programming Features:

BST In the program mode, it backspaces one line.

SST In the program mode advances the line pointer one line.

GTO In the program mode can be used for simple branching to direct the program to a specific line: **GTO** 37. In the run mode, it can direct the pointer to a specific line, which is useful in editing.

R/S In the program mode stops execution of the program. In the run mode, it begins execution of the program.

$x < y$ $x \geq y$ $x \neq y$ $x = y$
- **+** **X** **÷** are used when a conditional test is
 $x < 0$ $x \geq 0$ $x \neq 0$ $x = 0$
 necessary to determine which step to perform next.

PAUSE
R/S Pause stops program execution for one second and displays the contents of the x register.
NOP no operation is performed when this command is encountered.

■ **3** Takes the absolute of the displayed number.
 A BS

Hewlett-Packard Company

Hewlett-Packard (HP) is the world's largest manufacturer of electronic measuring instruments. Its sales for 1974 were in excess of \$880 million. Sales of computers and calculators represented approximately 25% of total sales.

Hewlett-Packard is a large stable company that should continue to be an industry leader in highly sophisticated portable calculators.