The HP-45 has more functions, more features than any of the competition. That's why it does so much more for you!

Hewlett-Packard confidently invites you to compare any other brand of scientific pocket calculator against the HP-45 *Advanced Scientific Pocket Calculator*—feature against feature . . . function against function.

Don't just compare what's visible on the outside. Compare what's *inside,* too.

For example, compare the number of registers. Most other calculators have 1 or 2. The HP-45 has 14!

Compare the type of logic used. The HP-45 uses RPN (Reverse Polish Notation)— "computer logic"—the *only* system that allows you to solve *any* problem without restructuring, so there's far less chance for error.

And compare the pre-programmed function keys. The HP-45 has 48 arithmetic, trigonometric, logarithmic and data manipulation operations. Yet it's still compact enough to fit in your shirt pocket.

Compare . . . and you'll quickly discover that the HP-45 is exactly what *you* need to solve *your* problems . . . anywhere, anytime!

If you're still using a slide rule, you'll find that the HP-45 is up to 50 times faster . . . and far more accurate.

If you're still tied down to cumbersome log and trig tables, you'll be happy to know that all of the tables are pre-programmed into the HP-45. All you need do is press a few keys!

And even if you have access to an on-line computer, the HP-45 can save you minutes, hours or days of waiting time . . . by giving you the answers you need *when you need them.*

Yes, compare the HP-45 . . . try the HP-45 . . . and you'll *see* why it's now the standard of the industry!

Only the HP-45 has 9 addressable memory registers...a 4-register operational stack...and a "Last x" register
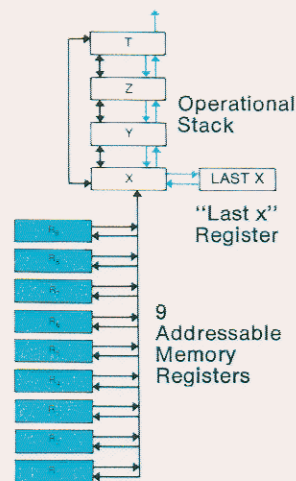
The more entries or intermediate solutions a calculator remembers for you, the less remembering—or writing down—*you* have to do. And the less chance for error.

The HP-45 has more registers than any other brand of scientific pocket calculator—14. Fourteen reasons why the HP-45 solves even the most complex problems faster . . . easier . . . and more accurately.

The exclusive 4-register operational stack retains as many as 4 intermediate solutions in sequence, and automatically positions them for use on a last in, first out basis. At the proper time, the solutions are *automatically* entered into the calculation being performed, so you don't have to re-enter them manually. It's this automatic operation of the 4-register stack that makes RPN (Reverse Polish Notation) possible.

The stack design also permits X and Y register exchange, and roll-down of any entry to the display for review or other operation.

The "Last x" register permits error correction or multiple operations. When a function is performed, the last input argument of the calculation is automatically stored in the "Last x" register. This argument can be quickly and easily recalled to correct an error, or to perform another operation using the same number.

9 addressable memory registers make data manipulation easy. You can store data (an intermediate solution, a constant, etc.) in any of the 9 registers . . . retrieve it instantly . . . and even do register arithmetic ($+$, $-$, $\times$, $\div$) using or modifying data in any register.

The HP-45 uses RPN to give you confidence in computation every step of the way

Most other scientific pocket calculators (and all of the bargain-priced, limited-function calculators) use algebraic logic. It's easy to learn, but there are some serious drawbacks.

For example, when using it to solve complex problems, you often have to restructure the problem to conform to the logic. (Then you worry whether or not you restructured it properly, because if you didn't your answer will be wrong!)

The HP-45, however, uses RPN (Reverse Polish Notation)— "computer logic." It should take you all of about two minutes to master, and once you do . . .

- *Every problem can be solved just the way it's written,* in natural, left-to-right sequence. No restructuring . . . no confusing rules to remember. Regardless of the type of problem, you can solve it using just one simple sequence of steps!

- *You can start solving the problem immediately.* There's no need to think the problem all the way through beforehand. You can even change your mind midway without having to start over!

- *You see every intermediate solution on the display.* Thus it's easy to check the progress of your calculations as you go. No need to worry whether you're going wrong!

- *You can recall previously-entered data instantly.* Just press the R↓ key to "roll down" the operational stack, for review or other operation.

RPN gives you "confidence in computation"—confidence that the data was entered correctly . . . that the intermediate solutions are what they should be . . . and that the final solution is free from error.

Also, problem-solving is faster, especially with any calculation sequence involving arithmetic, trigonometric, logarithmic, power or exponential functions. Not only is there no restructuring to do, but, in most cases, fewer keystrokes are required. And, you don't have all those intermediate solutions to jot down and re-enter, thanks to the HP-45's operational stack and memory registers.

RPN—another Hewlett-Packard exclusive in pocket calculators!

Unique "shift key" doubles the function of 24 keys

The Gold Key gives the HP-45 increased capability with no increase in size! Primary functions are labeled on the keys, with alternate functions above. To utilize an alternate function, simply press the Gold Key first, then the appropriate key.

SCI

FIX

Two display modes offer versatility

Unless programmed otherwise, the HP-45 automatically rounds off the display to two decimal places. But by pressing "FIX," then any digit key from 0 to 9, you can specify the number of decimal places shown on the display (example below). The full accuracy is always maintained internally. The fixed decimal display automatically overflows to full scientific display and underflows to zero

123.4567

Fix 4

By pressing the Gold Key, then "SCI," you can manually change the display to scientific notation (example below), which is useful when working with very large or very small numbers. You can specify the number of significant digits displayed after the decimal point (from 0 to 9) in either mode.

1.2345   02
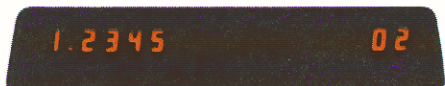
Scientific Notation 4

→ R

→ P

Convert polar to rectangular coordinates or vice versa. Vector calculations are simple too!

Simply press this key to convert to polar coordinates, or press the Gold Key and then this key to convert to rectangular coordinates. Vector calculations are simple on the HP-45. To add or subtract vector components, you may combine the polar-rectangular function with the accumulation function: "$\Sigma+$."

cm/in   kg/lb   ltr/gal

7   8   9
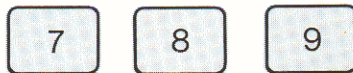
Metric/U.S. unit constants are pre-programmed in for immediate conversion

You can quickly convert U.S. units to metric units, or convert metric units to U.S. units, for rapid calculation of problems involving length, weight or volume. And you get 10-digit accuracy!

$\Sigma-$ $\bar{x}$,s

$\Sigma+$ R↓

These keys make statistical analysis easy

The "$\Sigma+$" key provides a running total when summing numbers, keeps track of the number of entries and automatically computes the sum of the squares. The "$\bar{x}$,s" key calculates the arithmetic mean and the standard deviation of the numbers entered. The HP-45 can simultaneously accumulate two sets of numbers.

n!

$x \gtrless y$

The factorial function lets you quickly calculate combinations and permutations

Merely press the Gold Key, then the key for "n!" to quickly calculate the factorial of positive integers. Instead of spending many minutes on such problems, you can do them in just seconds!

SIN⁻¹   COS⁻¹   TAN⁻¹

SIN   COS   TAN

→ D.MS   D.MS →

STO   RCL

DEG   RAD   GRD

ENTER↑   CHS   EEX

Trigonometric functions may be performed in any of 3 selectable angular modes, with instant conversion to or from degrees/minutes/seconds

You can perform trig operations in degrees, radians or grads (European system) simply by pressing the Gold Key, then the appropriate mode key. All trig functions calculate decimal angles in whichever angular mode is specified.

In a similar way, you can instantly convert from an angle in any angular mode to d/m/s (degrees/minutes/seconds or hours/minutes/seconds). For example, $45.89° = 45° 53'24"$. The answer is automatically rounded to the nearest second. Or you can convert from d/m/s to the equivalent decimal angle.

By changing angular modes between these steps, you can also convert any decimal angle from one mode to another.
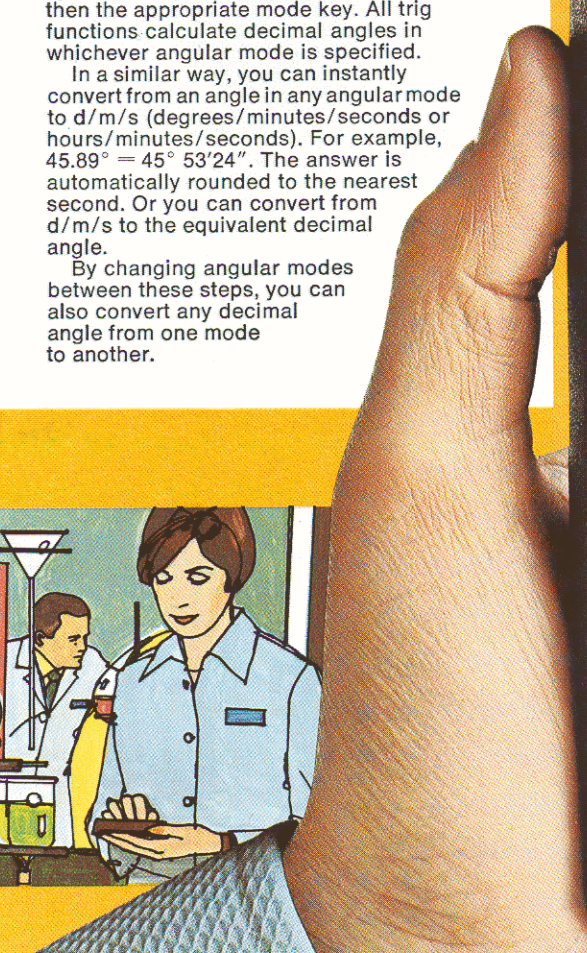
log

ln

For the natural log, press "ln"; it takes the log of the value displayed in base e (2.718 . . .). For the common log, press the Gold Key, then the key for "log"; it takes the log of the value displayed in base 10.

y^x 10^x

1/x   **e^x**

Raise a positive number (an integer or a decimal) to any power by simply entering the number, then pressing the Gold Key and "y^x". You can extend the answer up to nine decimal places.

Pressing the "e^x" key (natural antilog) raises e (2.718 . . .) to the power of the value displayed. Pressing the Gold Key, then the key for "10^x" (common antilog) raises 10 to the power of the value displayed.

△%

%

Calculate percentage problems by simply pressing "%" after entering the percent value. There's no need to convert percents to their decimal equivalent! Press the Gold Key, then "△%" to instantly compute the percent difference between two numbers. You can also quickly calculate the net amount, by pressing "+" or "−" after figuring the percentage.

y^x

1/x

To calculate reciprocals, key in the number, then press "1/x." The "x" in the symbol represents the currently displayed value, so you can calculate the reciprocal of a value in a previous calculation without re-entering the number.

LAST x

0

When a function is performed, the last input argument of the calculation is automatically stored in the "LAST x" register. By pressing the Gold Key, then the key for "LAST x", you can recall the argument to correct an error or perform another operation using the same numbers.

RAD

CHS

You are able to key in negative numbers by first entering a positive number, then pressing the "CHange Sign" key. Or you can change the sign of any number already displayed by pressing this key.

$\sqrt{x}$

x^2

To find the square root of a number, key in the number, then press the Gold Key, then the key for "$\sqrt{x}$." The "x" in the symbol represents the currently displayed value, so you can calculate its square root without re-entering the number. To square a number currently displayed, just press "x^2".

GRD

EEX

The "Enter EXponent" key lets you key in numbers having exponents—either positive or negative. You may also save time in certain calculations by keying in exact powers of 10.

$5 \cdot 424942499 - 12$

The HP-45 features an easy-to-see light-emitting diode display, in bright red. All digits appear as continuous—not broken—solid lines.

n!   **$\bar{x}, s$**   **→ D.MS**   **D.MS →**

$x \rightleftarrows y$ **R↓**   **STO**   **RCL**

DEG

ENTER ↑

These data control keys let you load and manipulate data. You can: load constant values, so you can use the numbers repeatedly; store numbers for deferred calculations; display numbers previously saved; reverse the order of the numbers saved.

Used with the 4-register operational stack and the 9 addressable registers, they help make the HP-45 _unsurpassed_ in pre-programmed scientific calculators.
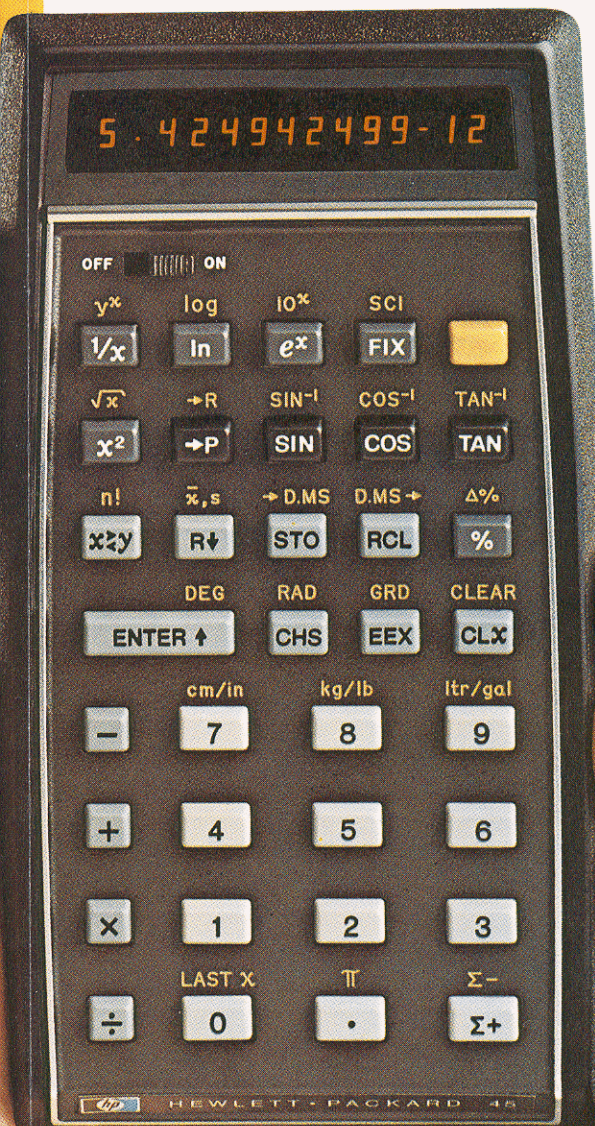
ACTUAL SIZE
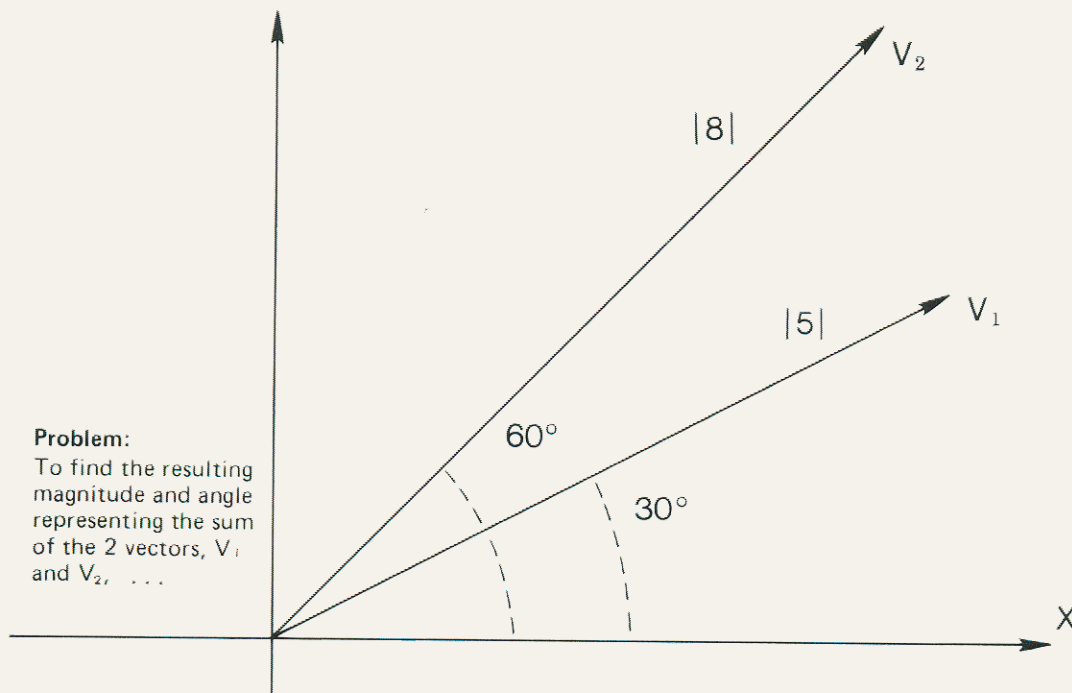
Problem:
To find the resulting magnitude and angle representing the sum of the 2 vectors, V₁ and V₂, . . .

Only the HP-45 enables you to solve complex problems like this in seconds—by pressing just a few keys!

To calculate first vector . . .

1. Enter first angle `3` `0` `ENTER ↑`
2. Enter first magnitude `5`
3. Convert to rectangular `☐` `→P`
4. Accumulate x and y components `Σ+`

To calculate second vector . . .

1. Enter second angle `6` `0` `ENTER ↑`
2. Enter second magnitude `8`
3. Convert to rectangular `☐` `→P`
4. Accumulate x and y components `Σ+`

To obtain magnitude of resulting vector . . .

1. Recall sums of x and y components `RCL` `Σ+`
2. Convert to polar `→P`

   Magnitude: `12.58`

To obtain angle of resulting vector . . .

Exchange x and y `x⇄y`

   Angle: `48.54`

For additional accuracy . . .

Specify the number of digits `FIX` `8`

   To obtain: `48.53834675`

The HP-45 *Advanced* Scientific Pocket Calculator

The complete HP-45 outfit includes:

- HP-45 *Advanced* Scientific Pocket Calculator
- Battery pack that under normal use provides 3 to 5 hours of operation
- 115/230 V AC adapter/recharger that lets you operate the HP-45 on AC while the battery pack is recharging
- Soft carrying case
- Safety travel case that holds HP-45, recharger, Owner's Handbook, Quick Reference Guide and soft case
- Illustrated Owner's Handbook
- Quick Reference Guide
- Self-adhesive owner's name tags

Optional accessories: Security cradle; hard leather field carrying case; spare battery pack and holder. (Details sent with HP-45.)

Warranty

The HP-45 is warranted against defects in materials and workmanship for one (1) year from date of delivery. During the warranty period, Hewlett-Packard will repair or, at its option, replace components that prove to be defective when the calculator is returned, shipping prepaid, to a Hewlett-Packard Customer Service Facility.

This warranty does not apply if the HP-45 has been damaged by accident or misuse or as a result of service or modification by any person other than at an authorized Hewlett-Packard Customer Service Facility.

No other warranty is expressed or implied. Hewlett-Packard is not liable for consequential damage.

Hewlett-Packard reserves the right to make changes in materials and specifications without notice.

Pre-Programmed Functions:

- **Arithmetic:** add, subtract, multiply, divide, square root, square.
- **Trigonometric** (decimal degrees, radians or grads): sine, arc sine, cosine, arc cosine, tangent, arc tangent, rectangular/polar coordinate conversions, vector arithmetic, conversions between operating mode and degrees/minutes/seconds.
- **Logarithmic:** natural logarithm, natural antilogarithm, common logarithm, common antilogarithm.
- **Statistical:** mean, standard deviation, sum-of-the-squares, factorial.
- **Other:** y^x, $1/x$, π, %, $\triangle$%, metric/U.S. unit conversion constants, register arithmetic, data storage and positioning functions.

Features and Specifications:

- Display: Up to 10 significant digits plus 2-digit exponent and appropriate signs
- Dynamic range: 10^{-99} to 10^{99}
- Four-register operational stack
- Nine addressable memory registers
- "LAST x" register for error correction
- Automatic decimal point positioning
- Selective round-off; range: 0-9 decimal places
- Two display modes: fixed point and scientific
- Indicators for improper operations and low battery condition
- Operates on rechargeable batteries or AC
- Solid state electronics
- Light-emitting diode (LED) display
- Tactile feedback keyboard
- Compact, contoured case

Power:

AC: 115 or 230 V, ±10%, 50 to 60 Hz, 5 watts. Battery: 500 mw derived from nickel-cadmium rechargeable battery pack.

Weight:

HP-45: 9 ounces (255 g)
Recharger: 5 ounces (142 g)
Shipping Weight: 2 lbs. approx. (900 g)

Dimensions:

Length: 5.8 inches (14.7 cm)
Width: 3.2 inches (8.1 cm)
Height: 0.7 to 1.3 inches (1.8 to 3.3 cm)

Operating Temperature Range:

32°F to 122°F (0°C to 50°C)

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Hewlett-Packard makes the most advanced pocket-sized computer calculators in the world!