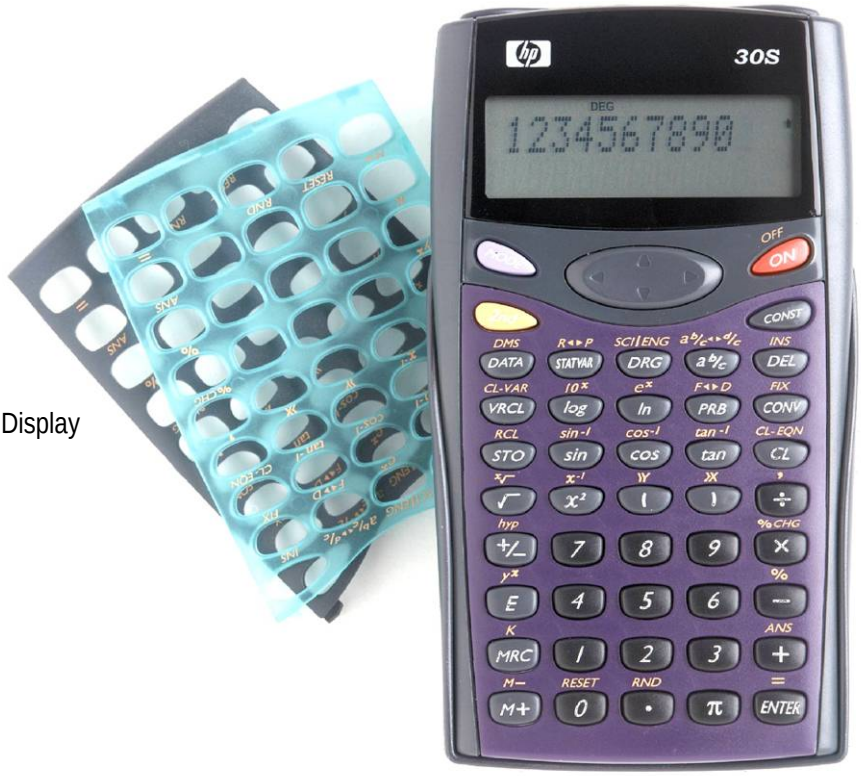
hp calculators



HP 30S Operating Modes and Display Format

The MODE Key

The HOME Mode

The STAT Mode

The L SOLV and Q SOLV Modes

The Angle Mode

Display Format

HP 30S Operating Modes and Display Format

This learning module introduces the different operating modes in which your HP 30S can work. It also describes the angular mode used by the trigonometric functions. Finally, you will find a description of the various display formats available.

The MODE key (MODE)

This key displays a menu containing the four operating modes available on your HP 30S. The active mode appears underlined in the mode menu. You can use the ◄ and ► keys ands then press ENTER to select the desired mode, or alternatively you can simply press the mode number: they are 0) HOME, 1) STAT, 2) L SOLV and 3) Q SOLV. Pressing CL cancels this menu returning to the mode that was active when MODE was pressed.

While the mode menu is displayed, you can use the ▲ and ▼ keys to adjust the display contrast.

The HOME mode

It is the default mode and the one you will use most of the time. Use this mode for most calculations (arithmetic and function calculations). Expressions stored in EQN can also be executed in this mode, provided they do not contain the 2nd and 2nd symbols.

The STAT mode

Used for statistical calculations. When this mode is selected another menu is displayed with the following options: 1-VAR for single-variable statistics, 2-VAR for two-variable statistics, and CLR-DATA which clears all the statistical data that has been entered. The history stack is not available in this mode. The EQN variable is not available either, but its contents are not lost. When this mode is active, the STAT annunciator is lit. Several learning modules for the HP 30S deal with statistical calculations.

The L SOLV and Q SOLV modes

In these modes, described in the HP 30S learning modules *Solving Linear Systems* and *Solving Quadratic Equations* respectively, systems of two linear equations and quadratic equations can be solved easily using the 2nd , 2nd and 2nd keys. The annunciators that are displayed are $_{L}$SOLV and $_{Q}$SOLV. All HOME functions are available.

The Angle mode

The angle mode is always shown in the display of your HP 30S. DEG, RAD and GRAD stand for the three angle units Degrees, Radians and Grads respectively. Setting the angle mode is as simple as pressing the DRG key, selecting the desired mode and pressing ENTER (or you can press CL to disregard any changes and quit the DRG menu). Angle values are:

Degrees	360 degrees in a circle
Radians	2π radians in a circle
Grads	400 grads in a circle

The angular unit affect trigonometric calculations and polar/rectangular coordinate conversions.

Display format

The default format is Floating Point, in which the number of displayed decimal places is not fixed but depends on the result. All digits are displayed except *trailing* zeros. Up to 9 decimal places can be displayed. You can set the number of decimal places displayed, though, to any number from 0 to 9 by pressing 2nd FIX and then the desired number – the ENTER key is not required now . This is called a fixed display format because the number of displayed decimal digits is always the same, trailing zeros are appended if needed. To restore the default mode press 2nd FIX . (decimal point). 2nd FIX displays results rounded to a fixed number of decimal places, but the actual numbers (that is, the ones internally stored) are not altered.

Example 1: Calculate $8\pi^2$ in the default mode.

Solution: To make sure you are currently in the default mode, press 2nd FIX . 2nd SCIIENG select FLO and press ENTER . The calculator is now in Floating Point mode with all digits being displayed. Press:

8 π x^2 ENTER

Answer: 78.95683521

Example 2: Calculate $8\pi^2$ showing only two decimal digits.

Solution: With the previous result still displayed, simply press:

2nd FIX 2

The result has been rounded to two decimal places.

Answer: 78.96

When you select floating point (2nd FIX .) again, all digits reappear because the internal value remains untouched, and is used in chain calculations to full precision. To round an operation to the current display setting use the RND function (2nd RND); when this result is used in another calculation, it is the rounded number that will be used instead.

Example 3: Round π to two decimal digits and display this number to 6 decimal digits.

Solution: Assuming FIX 2 is still the current format, press:

π ENTER

3.14 is displayed but the internal number is still 3.141592654 (and so on up to 22 digits). Press:

2nd RND 2nd ANS ENTER

Now the internal result has been rounded. Finally, pressing 2nd FIX 6 displays four trailing zeros.

Answer: 3.140000

Three number display formats are available on the HP 30S, namely Floating Point, Scientific format and Engineering format. They are accessed through the SCI/ENG menu (2nd SCI/ENG).

As stated above, the Floating Point format is set by default and corresponds to the full-precision display. Additionally, the number of displayed decimal places can be set beforehand by pressing 2nd FIX .

In Scientific format, results are displayed with an exponent, one digit to the left of the decimal point, and the number of decimal places specified by the current FIX setting.

Example 4: Display 123.456789 in Scientific format with five decimal digits.

Solution: Let's key in the number 123.456789 and then set the display format to Scientific: press

1 2 3 . 4 5 6 7 8 9 2nd SCI/ENG

select SCI and press ENTER . Let's now fix the number of decimal digits to 5 by pressing:

2nd FIX 5

Answer: 1.23457×10^{02}

In Engineering format, results are displayed with an exponent that is a multiple of 3, and the number of significant digits beyond the first one specified by the current FIX setting. For example, in Engineering 5 format the previous result becomes 123.45679×10^{00}.

Example 5: Display 123.456×10^{7} in Engineering format with five decimal digits.

Solution: Let's key in the number:

1 2 3 . 4 5 6 E 7 ENTER

and now set the display format to Engineering. To do so, press: 2nd SCI/ENG , next select ENG and finally press ENTER . The number of decimal digits is already 5 from the previous example.

Answer: 1.23456×10^{09}

Note that the SCI and ENG annunciators are lit when these formats are active. Also, the FIX annunciator is turned on whenever a fixed number of decimal places has been specified (i.e. F0 through F9, but not F·)

It is worth noting that there are two particular combinations of FIX and SCI/ENG settings that are not present on many other calculators, and that you may find particularly convenient. They are the non-fixed SCI and ENG formats, which can be set by pressing 2nd FIX . 2nd SCI/ENG and then the ENTER key after selecting either SCI or ENG with the ◄ and ► keys.