hp calculators

HP 49G+ Using the EquationWriter – Part 2

The EquationWriter

Practice manipulating formulae in the EquationWriter

The EquationWriter

One of the most useful built-in applications of the HP49G+ is the EquationWriter. This is the best environment for writing, editing and mathematically manipulating formulae. The EquationWriter allows quick and easy work that is very difficult or even impossible to do from the command line. It displays formulae in textbook format, allowing a much easier recognition of terms than the command line since the need to keep track of parentheses is reduced to a minimum. In addition, all commands for formula manipulation can be used, making thus the EquationWriter to a full flavoured environment for work with algebraic objects.

You access the EquationWriter with [→] [EQW] .

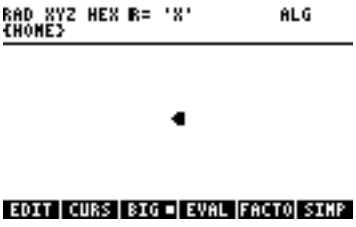


Figure 1

The blinking arrow is the cursor of the EquationWriter. Anything you write is placed at the position of the cursor. The menu items in brief are:

EDIT : Allows to edit a sub expression separately in the command line.
CURS: Switch cursor modes
BIG: Switch font used for display
EVAL: Evaluate sub expression
FACTOR: Factor sub expression
SIMP: Simplify sub expression

(Second menu page)
CMDS: Display the CAS commands catalogue
HELP: Get help for the CAS commands

You can display any menu from inside the EquationWriter, select some of its commands and place it in the EquationWriter (if it is the command is a function allowed in algebraic objects). You can also apply some command from any menu to a sub expression in the EquationWriter, if the command returns one algebraic object.

In the following examples we practise using the features of the EquationWriter to write, edit, and mathematically manipulate expressions.

Practise manipulating formulae in the EquationWriter

Example 1: Write the expression below in the EquationWriter:

$$1+\cfrac{1}{x^2\cdot SIN(X)+\cfrac{1}{x^2\cdot SIN(X)+\cfrac{1}{x^2\cdot SIN(X)}}}$$

Solution: Assume RPN mode and soft menus. Start the equation writer.

[→] [EQW]

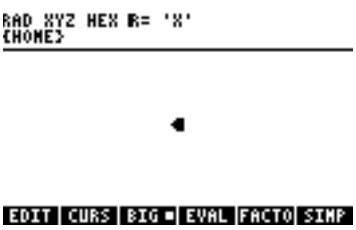


Figure 2

Begin writing the formula

1 + 1 ÷ X Y^X 2 ▶ SIN X

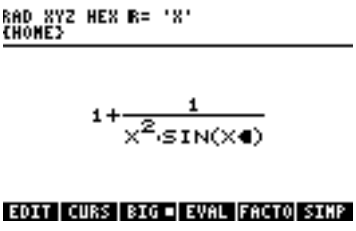


Figure 3

The sub expression $\frac{1}{x^2 \cdot \mathrm{SIN}(x)}$ has to be written another two times. Select it and copy it.

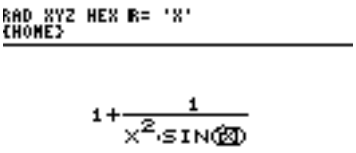


Figure 4

The EquationWriter has switched to a special mode that allows easy selection of sub expressions. The cursor changed to cross hairs. The selected sub expression is variable X of the sine function. Press ▲ and hold the key pressed until the cursor doesn't move any more. Release the key. Now the sub expression is selected that we want to copy.

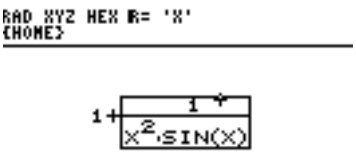


Figure 5

ENTER (accept the selection and return to normal selection mode)

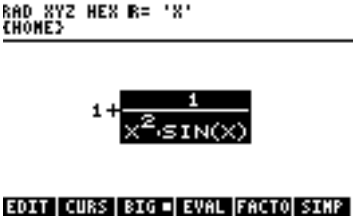


Figure 6

(copy the selected sub expression)

Continue writing the formula and paste the copied sub expression.

(paste)

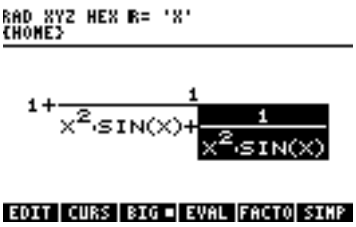


Figure 7

(paste) (repeat another time)

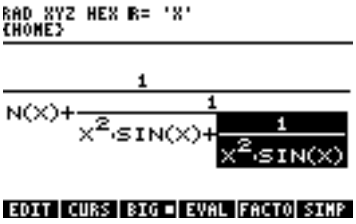


Figure 8

The formula is too big and doesn't fit completely in the screen. Switch to small font display.

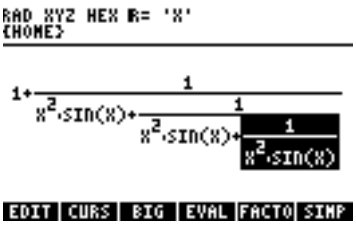


Figure 9

(switch back to big font display)

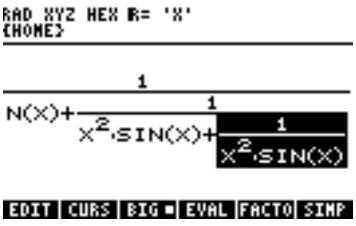


Figure 10

(put the formula in the command line or on the stack)

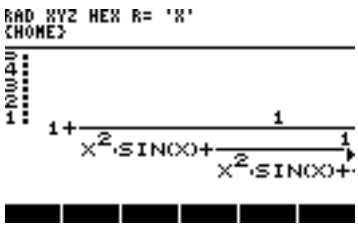


Figure 11

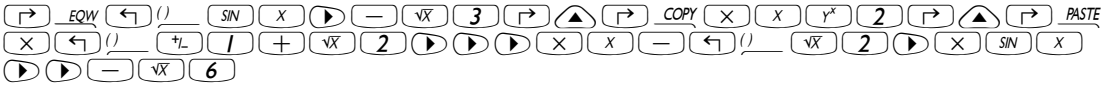
Answer:

$$1+\cfrac{1}{x^2\cdot\sin(x)+\cfrac{1}{x^2\cdot\sin(x)+\cfrac{1}{x^2\cdot\sin(x)}}}$$

Example 2: Factor the expression $(\sin(x)-\sqrt{3})\cdot x^2+(\sin(x)-\sqrt{3})\cdot(-1+\sqrt{2})\cdot x-(\sqrt{2}\cdot\sin(x)-\sqrt{6})$

Then re-expand the expression leaving factors with trigonometric terms untouched.

Solution: Start the equation writer and enter the expression.



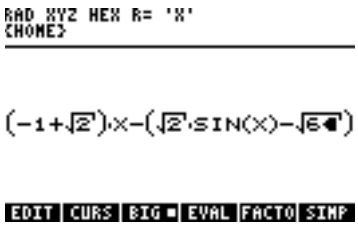


Figure 12

(select the whole expression and factor it)

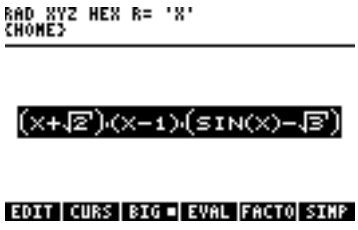


Figure 13

EVAL (select the first two factors and expand them)

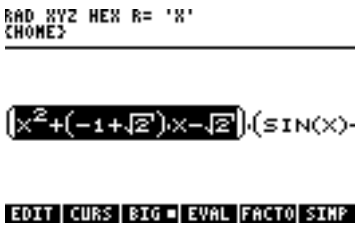


Figure 14

ENTER (enter the manipulated expression on the stack)

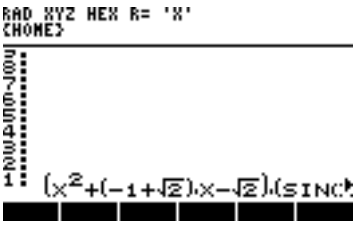


Figure 15

Answer: $\left(x^2+\left(-1+\sqrt{2}\right)\cdot x-\sqrt{2}\right)\cdot\left(\text{SIN}(x)-\sqrt{3}\right)$