

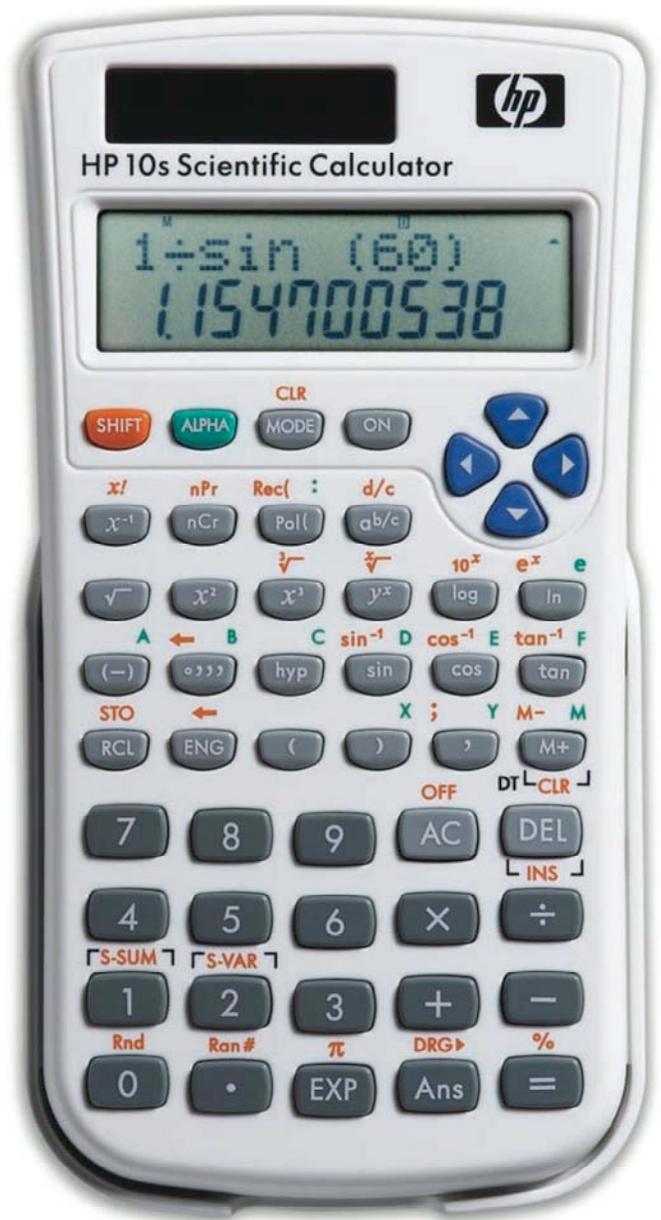


## hp calculators

### HP 10s Memory Calculations

#### The Memory Keys

#### Practice Using the Memory to Solve Problems



**The memory keys**

The HP 10s provides a special register, the memory (M), in which a number can be stored. If this number is different than zero then the M annunciator is lit. The contents of the memory can be recalled and be used in any calculation except in Statistics mode. The memory will save you having to write down results, and also many keystrokes when performing chain calculations, repetitive evaluations, etc. On the HP 10s the memory keys are called as follows:

- ◆ The Store key:  $\boxed{\text{SHIFT}} \boxed{\text{STO}}$   $\boxed{\text{M}}$  stores the displayed number in memory. The previous contents of the memory is lost, and the number in the display is not altered. No pending calculation is affected.
- ◆ The Recall key:  $\boxed{\text{RCL}}$   $\boxed{\text{M}}$  recalls the contents of the memory. The memory is not altered and pending calculations are not cancelled.
- ◆ The Sum key:  $\boxed{\text{M}^+}$  adds the displayed number to the contents of the memory. It does an implicit EQUALS first: the calculation in progress is performed and the result is displayed and added to the memory.

To clear the memory (that is, to turn off the M annunciator) simply store 0 in it by pressing  $\boxed{0} \boxed{\text{SHIFT}} \boxed{\text{STO}}$   $\boxed{\text{M}}$ .

**Practice using the memory to solve problems**

Example 1: Calculate  $1.46 + 12 - 7.5 + 67 + 987 + 6 - 89$  using the  $\boxed{\text{M}^+}$  key.

Solution: First of all, clear the memory:  $\boxed{0} \boxed{\text{SHIFT}} \boxed{\text{STO}}$   $\boxed{\text{M}}$ . We can add all these numbers as follows:

$\boxed{1} \boxed{\cdot} \boxed{4} \boxed{6} \boxed{\text{M}^+} \boxed{1} \boxed{2} \boxed{\text{M}^+} \boxed{(-)} \boxed{7} \boxed{\cdot} \boxed{5} \boxed{\text{M}^+} \boxed{6} \boxed{7} \boxed{\text{M}^+} \boxed{9} \boxed{8} \boxed{7} \boxed{\text{M}^+} \boxed{6} \boxed{\text{M}^+} \boxed{(-)} \boxed{8} \boxed{9} \boxed{\text{M}^+}$

Press  $\boxed{\text{RCL}}$   $\boxed{\text{M}}$  to display the answer.

Answer: 976.96

You may find it more convenient to use the usual way, that is:  $\boxed{1} \boxed{\cdot} \boxed{4} \boxed{6} \boxed{+} \boxed{1} \boxed{2} \boxed{-} \dots \boxed{-} \boxed{8} \boxed{9} \boxed{=}$  which is actually shorter, but consider this:

Example 2: Calculate the following operations, and find the sum of the first, second and fourth results:

$$35 \times \ln 5, -2 \times 8^5, \sqrt[3]{34} \text{ and } \frac{31}{13^{-3.5}}.$$

Solution: The  $\boxed{\text{M}^+}$  key allows us to select the numbers to be added. Clear the memory ( $\boxed{0} \boxed{\text{SHIFT}} \boxed{\text{STO}}$   $\boxed{\text{M}}$ ) and press:

$\boxed{3} \boxed{5} \boxed{\times} \boxed{\ln} \boxed{5} \boxed{=} \boxed{\text{M}^+}$   
 $\boxed{(-)} \boxed{2} \boxed{\times} \boxed{8} \boxed{y^x} \boxed{5} \boxed{=} \boxed{\text{M}^+}$   
 $\boxed{\text{SHIFT}} \boxed{\sqrt[3]{\phantom{x}}} \boxed{3} \boxed{4} \boxed{=} \boxed{\text{M}^+}$   
 $\boxed{3} \boxed{1} \boxed{\div} \boxed{1} \boxed{3} \boxed{y^x} \boxed{(-)} \boxed{3} \boxed{\cdot} \boxed{5} \boxed{=} \boxed{\text{M}^+}$

Press  $\boxed{\text{RCL}}$   $\boxed{\text{M}}$  to display the sum.

Answers: Rounded to two decimal places, the results are 56.33, -65536, 3.24 and 245563.28, respectively. The sum requested is 180083.61

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Example 3: Calculate  $\frac{(3.1267 + 34^2)^{-3.1267}}{3.1267 + \ln\sqrt{3.1267}}$

Solution: Since 3.1267 appears four times in this expression, we will store it in memory:

3 . 1 2 6 7  $\text{SHIFT}$   $\text{STO}$   $\text{M}$

which will save us quite a few keystrokes:

$\text{RCL}$   $\text{M}$  + 3 4  $x^2$  =  $y^x$  (-)  $\text{RCL}$   $\text{M}$   
 $\div$  (  $\text{RCL}$   $\text{M}$  +  $\ln$   $\sqrt{\phantom{x}}$   $\text{RCL}$   $\text{M}$  =

Answer:  $7.105079822 \cdot 10^{-11}$