TI-89 Calculator

How to store a number:

Enter into calculator: [number] [variable] [enter]

Example: 6.5 [STO] A [enter]

This will appear on your screen as: 6.5 → A

Example: Given the following values: \( a = 13, \ b = 2, \ c = 180, \ d = 17 \)

Evaluate the expression:

\[
2a + 5bc - \frac{8}{d^2}
\]

Now, try a couple on your own...

1. Evaluate the expression:

   \[5x + 3y - (2x - 8yz^3)\]
   
   where \( x=9, \ y=17, \ z=12 \)

2. Calculate:

   \[\frac{5}{8} + \frac{2}{3} + \frac{3}{15}\]

   Then, store the answer under the letter \( k \).

   Use that stored value to evaluate the following:

   \[25k - 7\left(\frac{k}{3} - 18\right)\]

Note: The store function can be helpful when dealing with frequently used scientific constants. For example, in physics, it might be handy to store the value of the gravitational constant \( g=9.8\text{m/s}^2 \) instead of having to key it in every time you do a kinematics problem.

First, store the number 9.8 under the letter \( g \), then use it to solve for the following value:

\[\text{Distance} = 18 + \frac{1}{2}g(1.5)^2\]

If you are going to save constants this way, it’s probably best to save them under letters that you don’t plan to use as variables (so, probably not \( x, \ y, \ z, \) or \( t \)). Also, if you clear all of your variables, remember that your saved constants will disappear as well.

Answers:

Example: \(\frac{527706}{289}\)

Practice problem 1: 235086

Practice problem 2: \(\frac{4613}{30}\)

Physics example: 29.025
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### How to clear a variable:

There are two options (both start from the home-screen):

To clear all variables:

![2ND](F6) [scroll down to 1: Clear a-z] ENTER

To clear a single variable:

![F4](scroll down to 4: DelVar) ENTER

This will bring you back to the home-screen.
Now, enter the variable that you want to clear.
Press: ENTER
The calculator should return “Done”
The variable will now have no value (t = t).

### How to find zeroes:

Start from the home screen.
Press F2 – This brings up the “Algebra” menu.
Scroll down to [4: zeros( ] and press ENTER.
Type the expression that you want to find the zeroes of.

Type and enter the variable that the expression is in terms of, close the parentheses, and press ENTER.
The calculator will output the zeroes as a list of numbers in brackets.

**Example:**
Input: zeros($x^4 - 2x^3 - 67x^2 + 8x + 252, x$)
Output: {-7, -2, 2, 9}
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Using the Solve function

Start from the home screen.

Press F2 – The first choice on the “Algebra” menu, “1: solve( ”, will be highlighted.

Press ENTER.

Type the equation that you want to solve (it should have an = in it somewhere).

Type and enter the variable that the expression is in terms of, close the parentheses, and press ENTER.

The calculator will output the answer or answers to the equation in terms of the selected variable.

Example:
Input: solve(45x – 24 = 111, x)
Output: x = 3

How to take Derivatives:

Start from the home screen.

Press F3 – The first choice on the “Calc” menu, “1: d( differentiate”, will be highlighted.

Press ENTER.

Type the expression that you want to differentiate.

Type and enter the variable that the expression is in terms of.

If you are doing a higher derivative than first, enter the number of the derivative order (i.e. 2 of a 2nd derivative). If you are just doing a first derivative, you do not need to enter anything (though you can enter a 1 if you want).

Close the parentheses, and press ENTER.

The calculator will output the answer (this may have variables, or just numbers – depending on what the problem is).

Example:
Select d( 

Enter x² + 2, and the variable the function is in terms of (in this case, x) and close parentheses 
Thus far, you should have: d(x² + 2, x) 
Press ENTER. Output: 2x

Now, take a second derivative. Copy d(x² + 2, x) from above in your home screen and edit it to read d(x² + 2, x, 2), then solve. 
Output: 2
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**How to integrate:**

For an indefinite integral:

Start from the home screen.

Press and scroll down to the second choice on the “Calc” menu – “2: ∫( integrate”.

Type the expression that you want to integrate.

Type and enter the variable that the expression is in terms of, close the parentheses, and press .

The calculator will output the answer (this will probably have variables in it, depending on what you are integrating).

For a definite integral:

Start from the home screen.

Press and scroll down to the second choice on the “Calc” menu – “2: ∫( integrate”.

Type the expression that you want to integrate.

Type and enter the variable that the expression is in terms of.

Type and enter the lower bound of your integration (what you are integrating “from”).

Type and enter the upper bound of your integration (what you are integrating “to”).

Close the parentheses, and press .

The calculator will output the answer (this will probably be a number).

**Example:**

Select \( \int \)

Enter \( x^2 + 2 \)

Enter and the variable the function is in terms of (in this case, \( x \)) and close parentheses

Thus far, you should have: \( \int (x^2 + 2, x) \)

Press .

Output: \( \frac{x^3}{3} + 2x \)

Now, scroll up and select \( \int (x^2 + 2, x) \) from above in your home screen and press .

Insert upper and lower limits of integration 1 and 3 as follows: \( \int (x^2 + 2, x, 1, 3) \) and solve.

Output: \( \frac{38}{3} \)