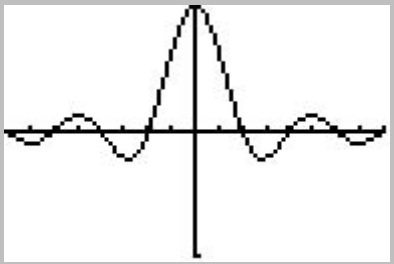
Graphics Calculators

Starting in ninth grade, you may use school provided calculators on exams.

Today you will learn many of the features available on TI graphics calculators.

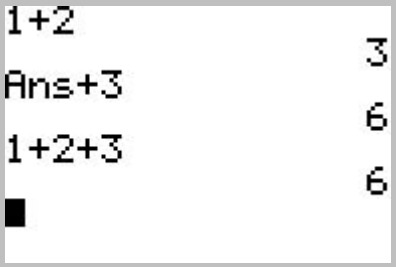


Plain Vanilla

The number pad and $+ - \times \div$ keys work as normal.

The ENTER key calculates whatever expression was just entered.

The previous answer will automatically be used if the next expression begins with an operation.



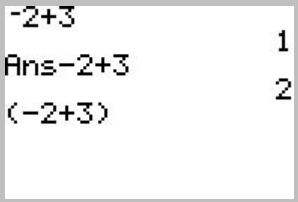
The previous answer can also be used by the **STO**, x^{-1} and x^2 keys.

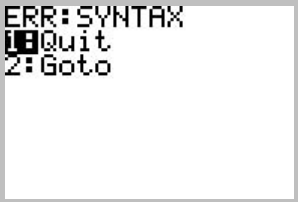
Negative vs Minus

The (-) key is used for negative numbers (the unary change sign operator).

On the calculator, it shows up as being raised relative to the regular - key (the binary subtraction operator).

Using the wrong minus key can give the wrong answer or cause an error.





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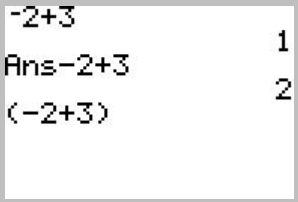

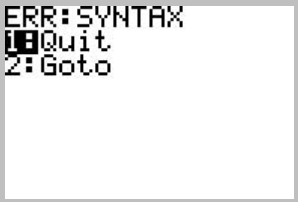

Proper Fractions

Example: $3\frac{2}{7} = (3 + 2/7)$

Parentheses are your Friends

Evaluate the expression $\frac{4+6}{3+7}$

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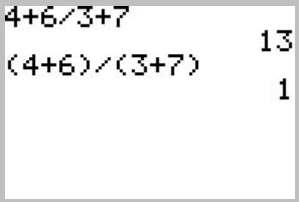

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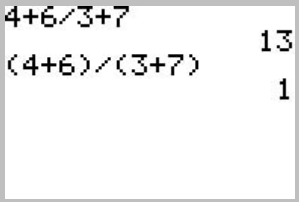

Evaluate $-x^2$ when $x = 2$ and x^2 when $x = -2$.

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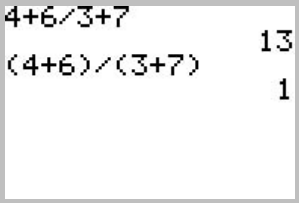

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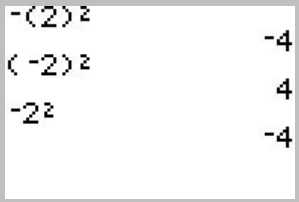

White, Yellow/Blue and Green

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2nd ALPHA will turn on letters until the **ALPHA** key is hit again.

Reset

The **CLEAR** and/or **2nd QUIT** keys will get you back from most places.

To clear memory and reset all the settings to their default values, enter the sequence

2nd + 7 1 2

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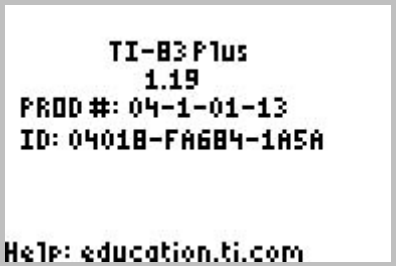
Each calculator has a unique ID. To see this ID number, hit

2nd + 1



Editing

Expressions may be edited using the left and right arrow keys, **DEL** (delete) and **2nd INS** (insert) buttons.

The **CLEAR** button erases the whole line or the whole screen.

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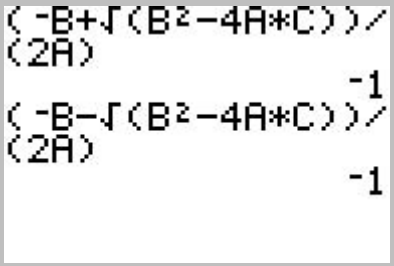

Menus

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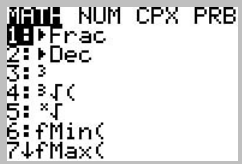
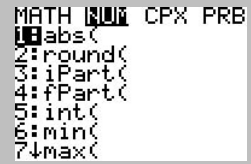
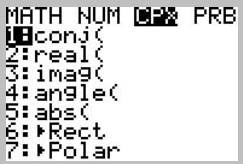
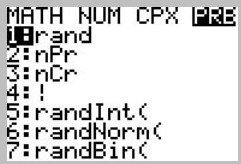
For example, the **MATH** key brings up 4 possible menus, labeled **MATH NUM CPX** and **PRB**.









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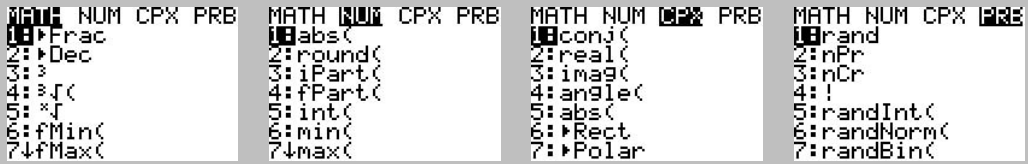


The down arrow (↓) indicates that there are more menu items available than shown.

Scientific Notation

The **MODE** menu allows one to display numbers in scientific notation (**Sci**).

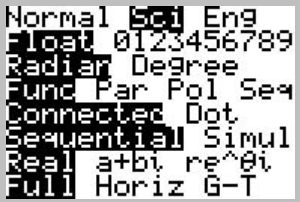
The E separates the exponent (base 10), so $123 = 1.23 \times 10^2$ would be displayed as 1.23E2.

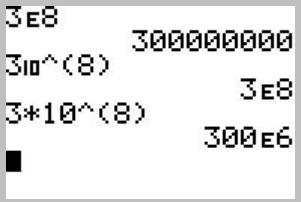
The **2nd EE** key allows you to enter numbers using scientific notation. Hitting

3 2nd EE 8

will produce 3×10^8.

One can also use the **2nd** 10^x key.

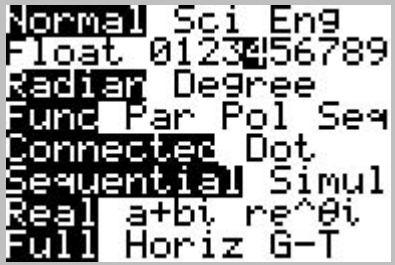


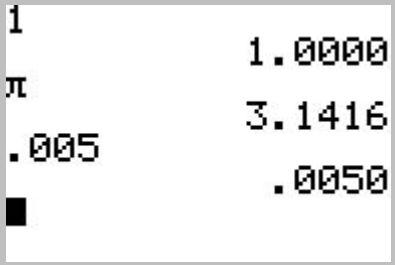


Engineering notation (**Eng**) is similar to **Sci**, except it uses powers of 1000.

Floating vs. Fixed Point

The MODE menu also allows you to specify how many decimals accuracy you want to display.





Exponents

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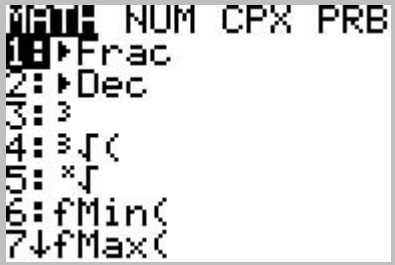

In addition, the **MATH** menu includes x^3 $\sqrt[3]{(}$ and $\sqrt[x]{}$.

Storing Numbers

On a calculator, a variable is just a place to store numbers.

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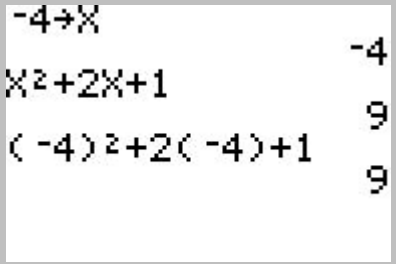
For example, evaluate $x^2 + 2x + 1$ when $x = -4$:



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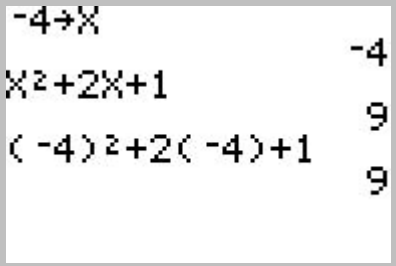
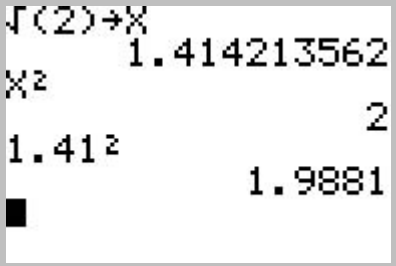
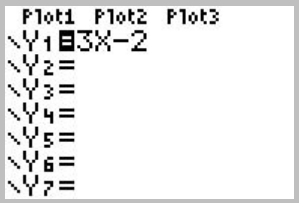


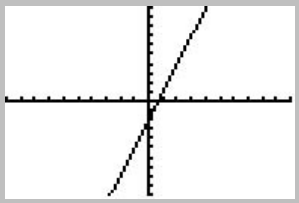


Every time you round a number you lose accuracy.

Graphing

To graph the function y = 3x - 2 one can hit the **Y=** button and enter $3X - 2$ after $\backslash Y_1 =$, then hit **GRAPH**.





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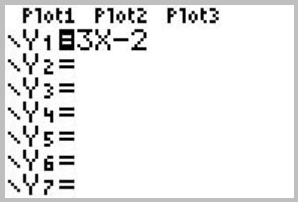

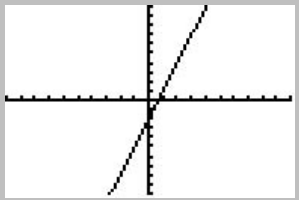

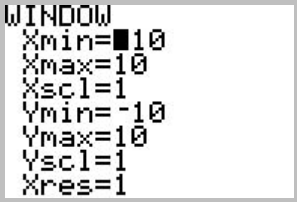

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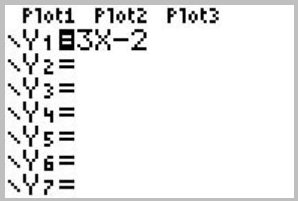

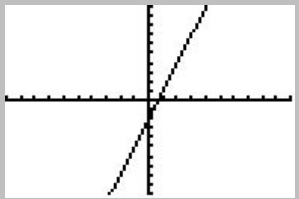

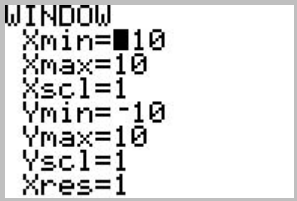

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The **ZOOM** button performs a similar function. **ZOOM 6** resets the window to its default values.

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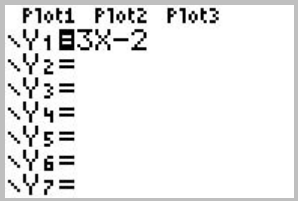

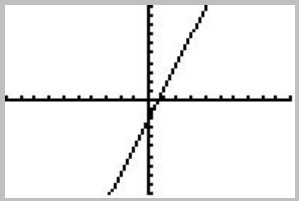

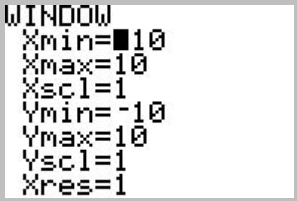

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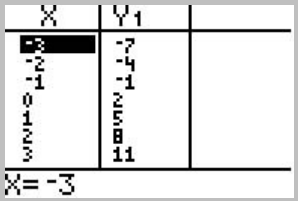
Up to 10 different functions can be graphed at the same time.

Tables

The **2nd TABLE** button reports the X and Y coordinates (for **Y=**) in table form.



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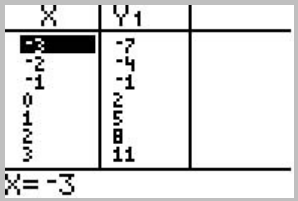

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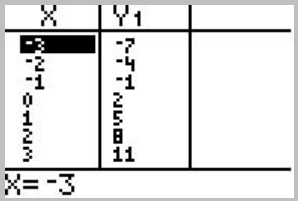

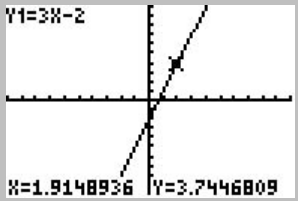

The **2nd TBLSET** button controls the starting X value and how far apart to generate table values.

The **TRACE** button also reports X and Y values, but for one function and one point at a time. The function and point selected can be moved using the arrow keys.

Plotting Points

One can also plot specific X and Y coordinates previously recorded. Up to 3 separate such plots can be shown together. Be sure to **CLEAR** out any functions in the **Y=** menu.

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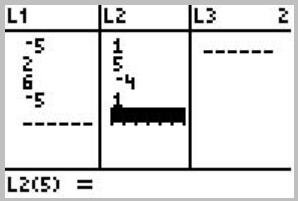

To enter these numbers use **STAT 1**. The number you type in is not recorded until you hit the **ENTER** button. You can select which entry to edit using the arrow keys. The **DEL** button will remove an entry (until you start typing). **2nd MEM 4 ENTER** will clear all lists.

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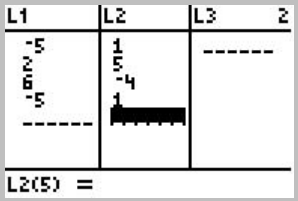
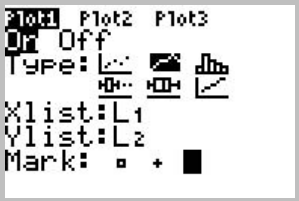


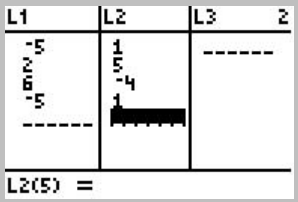


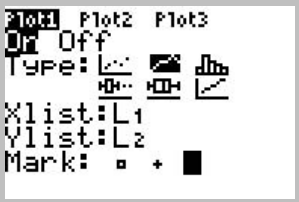
To enter these numbers use **STAT 1**. The number you type in is not recorded until you hit the **ENTER** button. You can select which entry to edit using the arrow keys. The **DEL** button will remove an entry (until you start typing). **2nd MEM 4 ENTER** will clear all lists.

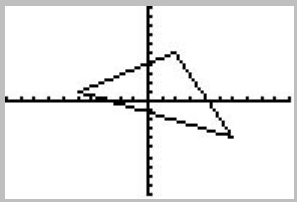
2nd STATPLOT ENTER brings up the menu for **Plot1**.

Plotting Points

One can also plot specific X and Y coordinates previously recorded. Up to 3 separate such plots can be shown together. Be sure to **CLEAR** out any functions in the **Y=** menu.







To enter these numbers use **STAT 1**. The number you type in is not recorded until you hit the **ENTER** button. You can select which entry to edit using the arrow keys. The **DEL** button will remove an entry (until you start typing). **2nd MEM 4 ENTER** will clear all lists.

2nd STATPLOT ENTER brings up the menu for **Plot1**.

GRAPH will then show the plot.

Wait, there's more!

In truth we have just scratched the surface of what this calculator is capable of.