

TI- 86 GRAPHING CALCULATOR BASICS

ORDER OF OPERATIONS

The TI-86 follows the order of operations, however the data must be input correctly.

Recall : Order of Operations follow:

Parenthesis

Exponents

Multiplication – **D**ivision (left to right as they occur)

Addition – **S**ubtraction (left to right as they occur)

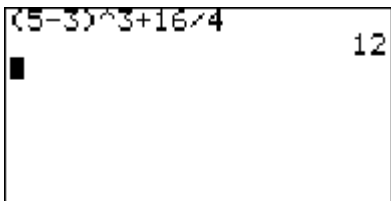
And hence **PEMDAS**

For example, compute the following:

1) $10 \div 2 - 3 \times 2 + 8$



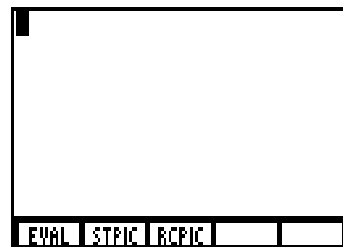
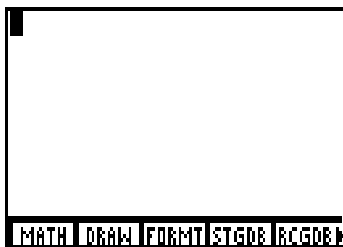
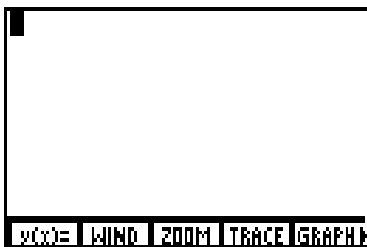
2) $(5 - 3)^3 + 16 \div 4$



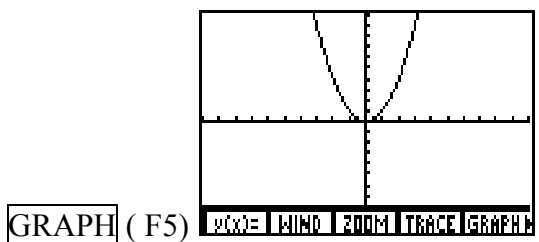
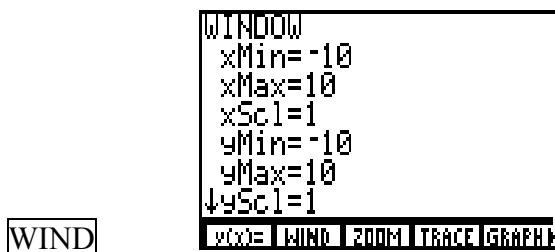
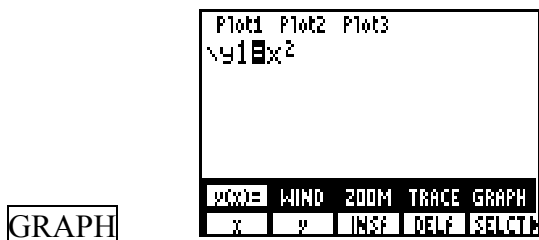
GRAPHING FUNCTIONS

Quick Overview of GRAPH MENU

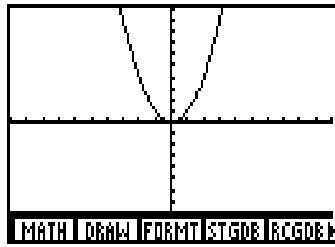
Depress **GRAPH** then the **MORE** key to advance to more menu items



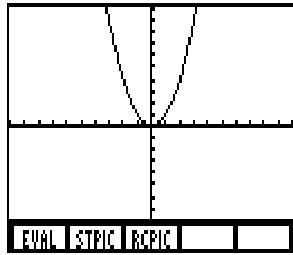
Activity - Graph the function $y = x^2$ and **evaluate** it at $x = 2$



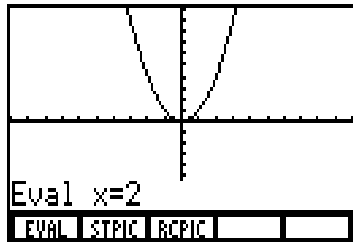
MORE



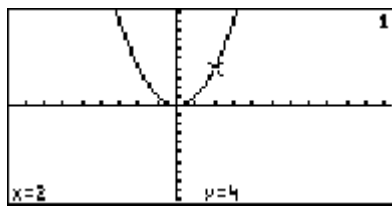
MORE



EVAL (F1)

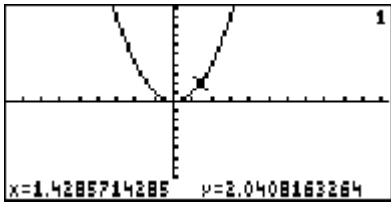


the result is

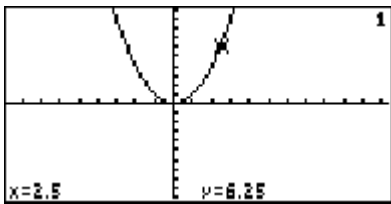


Use the **TRACE** feature:

Depress **TRACE** and use the cursor keys to get



If at this point you wish to find the value of the function at a particular point, we can input the value from this screen. This is a nice feature that allows us to bypass the **EVAL** key we used before (So long as the values we evaluate at are contained within the window).



Find the value of x^2 at:

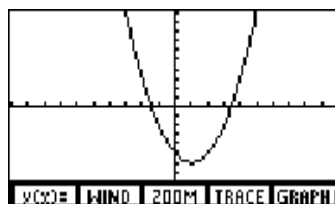
1. $x=2$
2. $x=3$
3. $x=4$ (We will need to adjust the Window for an accurate view).
4. $x=15$ Here we need to redefine the Xmax in WIND to contain $x=15$.

ROOTS OF A FUNCTION

SOLVE $0 = x^2 - 8x + 5$

Begin by defining a new function $y = x^2 - 2x - 5$

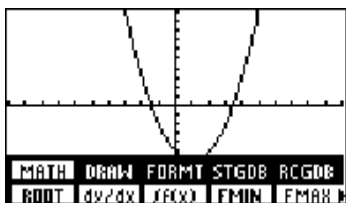
STEP1



Define the function and **Graph** it:

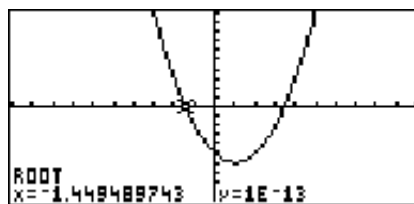
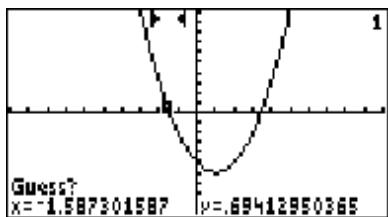
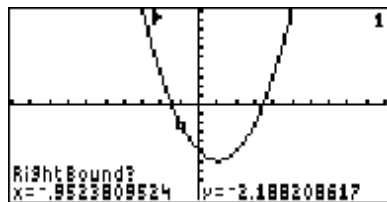
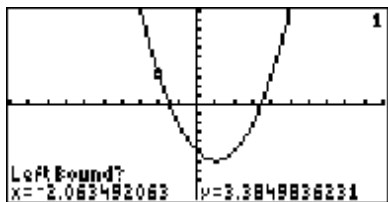
STEP2

** CHOOSE **MATH** from the **GRAPH** MENU **



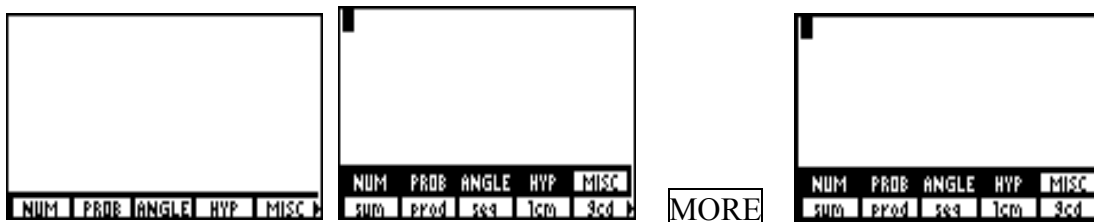
Depress **ROOT**

ENTER at each step gives the following sequence of screens.

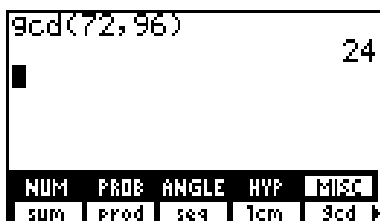


A Different **MATH** Menu

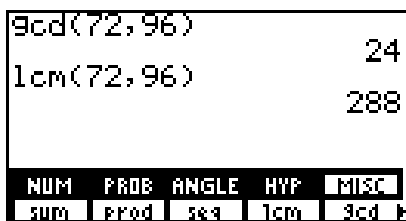
** ACCESS THE MATH MENU 2^{ND} X (Different from the Math Menu above)



Try a few problems: Find the gcd (72 , 96) i.e. Find Greatest Common Factor

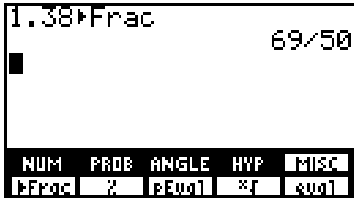


Find the LCM (72,96) - (Compare to the Lowest Common Denominator)



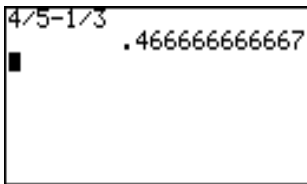
Write a decimal number as a fraction:

$$1.38 = \frac{69}{50}$$



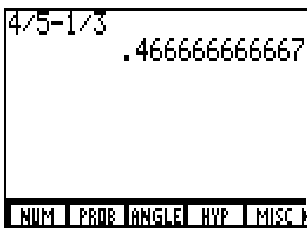
Reduce a to simplest form: $\frac{68}{132} = \frac{17}{33}$

Example: $\frac{4}{5} - \frac{1}{3}$

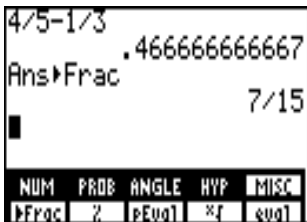


To represent this as a fraction, we repeat the steps above, using the MATH menu.

Depress 2ND X



and choose MISC MORE >FRAC



SCIENTIFIC NOTATION:

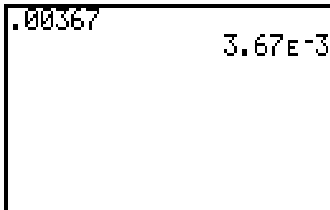
.003567 To Scientific notation: We depress the **2ND** **MORE** (this is the **MODE** menu)



and highlight **Sci** **ENTER** and depress **EXIT** to get back.

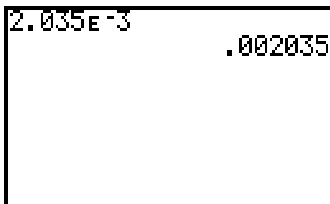


.003567 **ENTER**



To input a number in scientific notation we use the **E** key

2.035E-3 = .00235 Be sure to use the Negation key (-) and not the Subtraction key.



Compute $(6.03 \times 10^{14}) \times (1.11 \times 10^{-9})$ using the TI-86.

Method 1

```
6.03*10^14*1.11*10^-9
6.6933E5
```

or

```
(6.03*10^14)*(1.11*10^-9)
6.6933E5
```

Method 2

```
(6.03E14)*(1.11E-9)
6.6933E5
```

COMMON MISTAKES TO AVOID

- As a general rule, if you are not sure whether to include parenthesis...INCLUDE THEM.

Example. Compute $\sqrt[3]{8} \times \sqrt{16}$.

This can be re-written as $8^{\frac{1}{3}} \times 16^{\frac{1}{2}}$ which we know equals $2 \times 4 = 8$

The WRONG approach is:

```
8^1/3*16^1/2
```

and the INCORRECT Result obtained is

```
8^1/3*16^1/2
21.3333333333
```

The correct input should be:

```
8^(1/3)*16^(1/2)
```

and the correct answer is

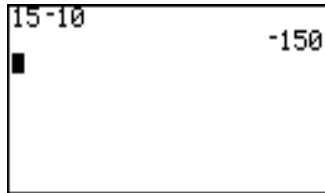
```
8^(1/3)*16^(1/2)
8
```

Another common error is the misuse of the subtraction key - and the negation key (-).

Example

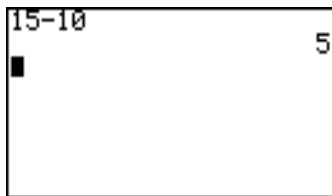
15-10

Using the INCORRECT key, negation (-) the result is :

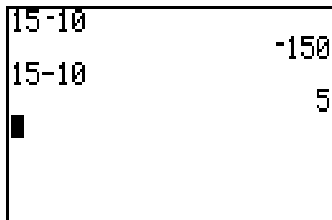


This is clearly incorrect. Can you guess how the calculator interprets this expression?

The CORRECT way is to use the subtraction key - .



If you look close enough, there is a clear distinction between the two.



Short Cuts

Depress the EXIT key to go back one screen/menu level.

Depress the QUIT key to get back to the “start” screen.

Please remember, this calculator is a tool and its effectiveness is limited to how well you know how to use it. Be sure to practice enough prior to using it on any exams.