



Calculator Handbook

by

David Miller

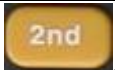
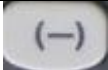
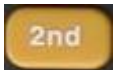



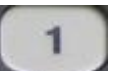
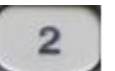
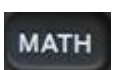


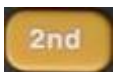

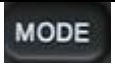

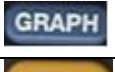
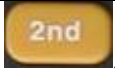
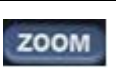



j.david.miller@nhmccd.edu

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Calculator Handbook

Basic Buttons

Function	Keystrokes
Answer Button: <ul style="list-style-type: none"> The last answer displayed is stored in memory as “Ans.” 	<ul style="list-style-type: none"> Push  , 
Clear Memory: <ul style="list-style-type: none"> Clears the calculator memory. It will erase all programs, applications, and anything stored in memory. 	<ul style="list-style-type: none"> Push  ,  ,  ,  ,  , 
Display as a Fraction: <ul style="list-style-type: none"> The calculator will display any rational decimal as a fraction. 	<ul style="list-style-type: none"> Push  ,  , 
Entry: <ul style="list-style-type: none"> Retypes the last line entered into calculator. Will return the last 30 entries if done repeatedly. 	<ul style="list-style-type: none"> Push  , 
Graph/Table: <ul style="list-style-type: none"> Will split the screen vertically between the Graph and Table to display both. 	<ul style="list-style-type: none"> Push  Scroll down and push  on “G-T” Push 
Grid: <ul style="list-style-type: none"> Will put a grid on the graphing window. 	<ul style="list-style-type: none"> Push  ,  Scroll down and push  on “GridOn”
SplitScreen: <ul style="list-style-type: none"> Will split the screen horizontally between the Homescreen, Table, or Graph. 	<ul style="list-style-type: none"> Push  Scroll down and push  on “Horiz”

Checking Inequalities with “Tests”

Example Problem:

$$\text{Solve: } x - 2 \geq 7$$

Solution:

$$x \geq 9$$







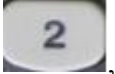
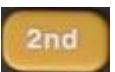
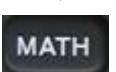
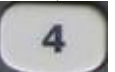
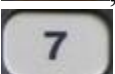

Checking the solution:

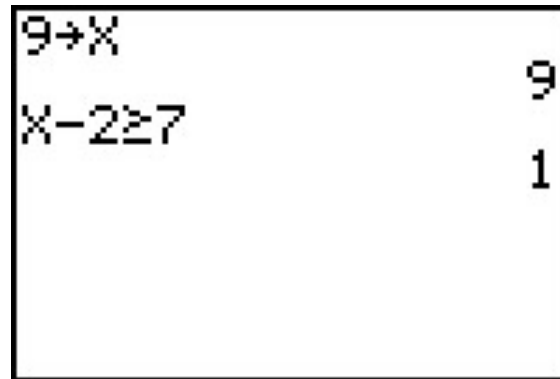
$$9 - 2 \geq 7$$

$$7 \geq 7$$

True

Calculator Steps:

- Push  ,  ,  ,

- Push  ,  ,  ,
 ,  ,  ,
 , 



- If the calculator displays “1,” then it is “true.”
- If the calculator displays “0,” then it is “false.”

Checking Ordered Pairs in Equations

Example Problem:

$$\text{Determine if } (2, -3) \text{ is a solution of } x - 4y = 14.$$

Solution:

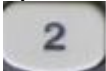



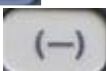
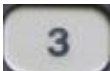


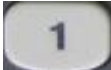







$$(2) - 4(-3) = 14$$

$$2 + 12 = 14$$

$$14 = 14$$

True

Calculator Steps

- Push  ,  ,  ,

- Push  ,  ,  ,
 ,  , 
- Push  ,  ,  ,
 ,  , 

$2 \rightarrow X$	2
$-3 \rightarrow Y$	-3
$X - 4Y$	14

Checking “Simplify Problems” Using the Table


Example Problem:

Simplify $2(5x - 4) - 2$


Solution:

$10x - 10$

Calculator Steps:

- Push  on the calculator
- Type the problem in Y_1
- Type the answer in Y_2

Plot1	Plot2	Plot3
$\setminus Y_1 = 2(5X - 4) - 2$		
$\setminus Y_2 = 10X - 10$		
$\setminus Y_3 =$		
$\setminus Y_4 =$		
$\setminus Y_5 =$		
$\setminus Y_6 =$		
$\setminus Y_7 =$		

- Push ,  to see the Table

X	Y1	Y2
0	0	0
10	10	10
20	20	20
30	30	30
40	40	40
50	50	50
60	60	60

X=1

- If the two Y columns are the same, then the answer is correct.

Checking “Solve Problems” using the HomeScreen

Example Problem:

$$\text{Solve: } 3x - 4 = 2x + 1$$



Solution:

$$x = 5$$

Calculator Steps:

- Store 5 to the calculator memory

- Push , , ,
- 

- Type the left side of the problem
and push 
- Type the right side of the problem
and push 

5→X	
3X-4	5
2X+1	11
	11

- If the two answers match, then the answer is correct.

Checking “Solve Problems” using the Intersection Method

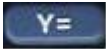
Example Problem:

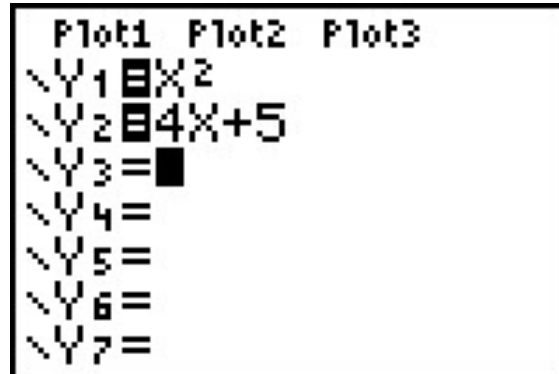
$$\text{Solve: } x^2 = 4x + 5$$

Solution:

$$x = -1, x = 5$$

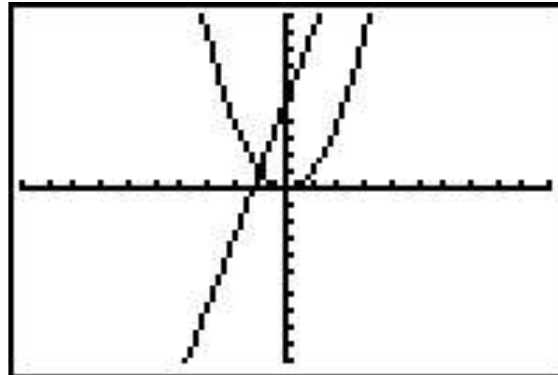
Calculator Steps:

- Push 
- Type the left side of the problem in Y_1
- Type the right side of the problem in Y_2

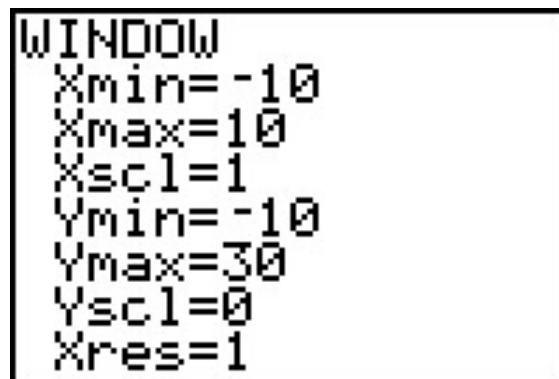


- Push  

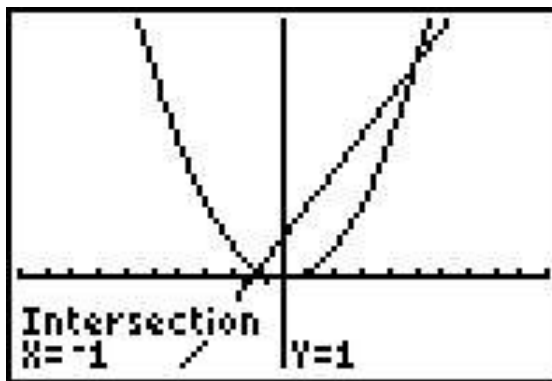
You have to see the graphs cross to get the answer!



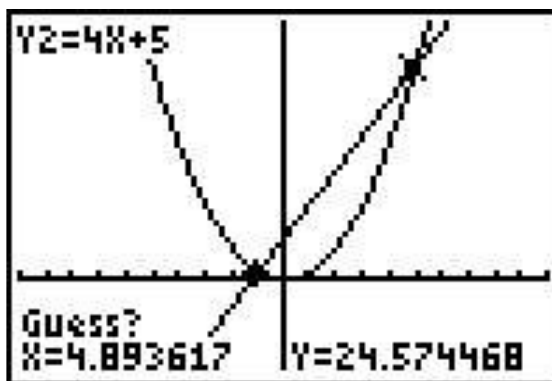
- Adjust Window if needed



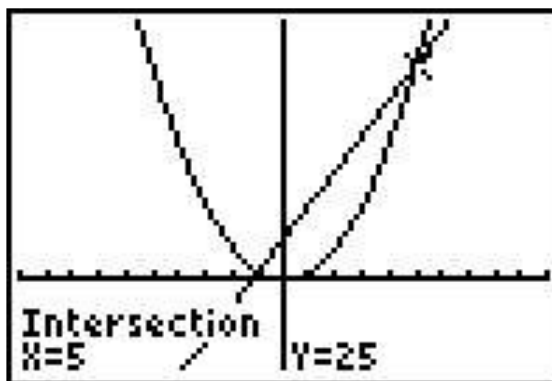
- Push **2nd**, **TRACE**, **5**,
ENTER, **ENTER**, **ENTER**



- If there's more than one answer repeat the last step, but before pressing **ENTER** the third time use the left/right arrow keys to move the cursor close to the other answer and then push **ENTER** the third time.



- The screen will say "Intersection" and below that it will say "X=" and the answer will be displayed.



Evaluating Complex Numbers

Sample Problem:

Write $\frac{3+5i}{1+i}$ in the form "a + bi"

Solution:

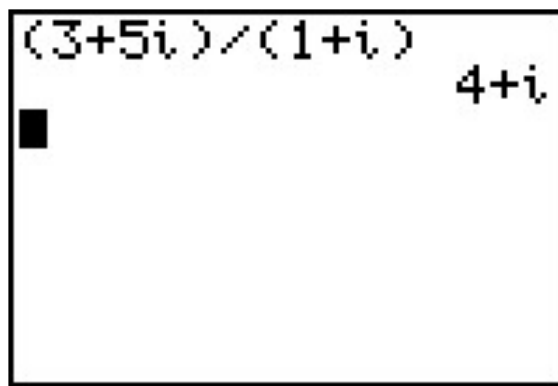
$$4+i$$

Calculator Steps:
Put calculator into Imaginary Mode

- Push **MODE**
- Scroll down and push **ENTER** on “a + bi”



- Push **(**, **3**, **+**, **5**, **2nd**, **.**, **)**, **÷**, **(**, **1**, **+**, **2nd**, **.**, **)**, **ENTER**



Evaluate Functions using the Table


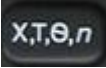





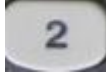

Example Problem:

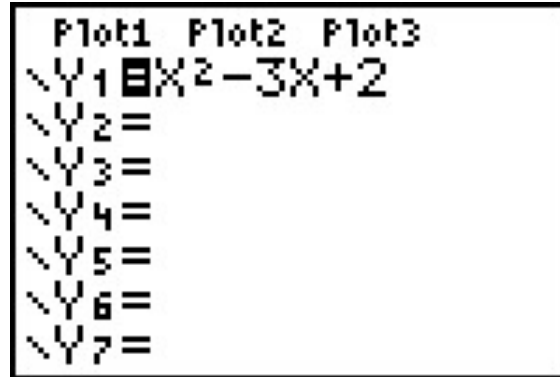
Given $f(x) = x^2 - 3x + 2$, find $f(-3)$.

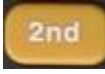

Solution:

$$f(-3) = 20$$

Calculator Steps:

- Push, , , ,
-   ,
-   



- Push ,
- Push .
- Scroll up or down until you find the appropriate x-value.

X	Y1	
-3	20	
-2	12	
-1	6	
0	2	
1	0	
2	0	
3	2	
X = -3		

The value in the Y_1 column will be the answer

Finding the Equation Given Two Points



Example Problem:

Find the slope given the points $(1,5), (3,1)$

Solution:

Equation: $y = -2x + 7$

Calculator Steps:

- Push , 
- Type in the ordered pairs (x's in L_1 , y's in L_2)

L1	L2	L3	1
1	5	-----	
2	1	-----	
L1(3)=			

- Push , , , 

```

LinReg
y=ax+b
a=-2
b=7
    
```

“a” is the coefficient and “b” is the constant.

Finding the Slope Given Two Points



Example Problem:

Find the slope given the points (1,5),(3,1)

Solution:

Slope = -2

Calculator Steps:

- Push , 
- Type in the ordered pairs (x's in L_1 , y's in L_2)

L1	L2	L3	1
1	5	-----	
2	1	-----	
L1(3)=			

- Push , , , 

“a” is the slope.

```

LinReg
y=ax+b
a=-2
b=7
    
```

Finding x-intercepts





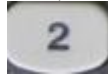


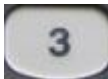


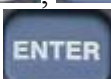
Example Problem:

Find the x-intercepts for $y = x^2 + 2x - 3$

Solution:

$(-3, 0), (1, 0)$

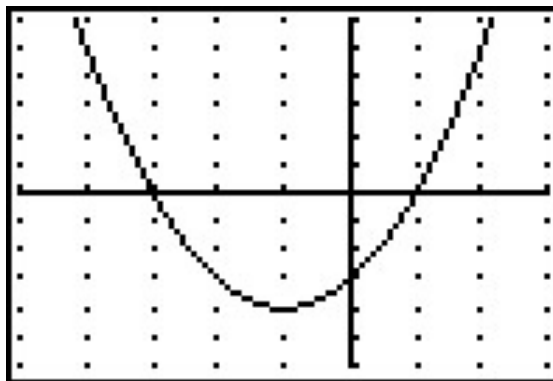
Calculator Steps:

- Push , , ,
- , , ,
- , , 
- Push , 

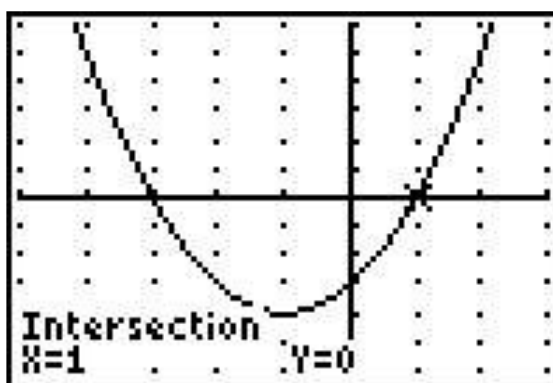
```

Plot1 Plot2 Plot3
\Y1=X²+2X-3
\Y2=0
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
    
```

- Push **GRAPH**
- You need to see all the x-intercepts on the graph to be able to find them.
- (Adjusting the Window might be needed.)



- Push, **2nd**, **TRACE**, **5**,
ENTER, **ENTER**, **ENTER**



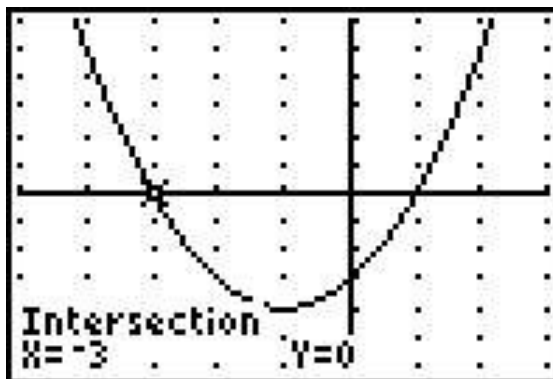
- To find the second x-intercept Push



- Before pushing **ENTER** a 3rd time push the arrows to the left or right to move the cursor close to the other x-intercept and then push



the third time.



The screen will say Intersection and display the x- and y-coordinates.

Finding y-intercepts

Sample Problem:

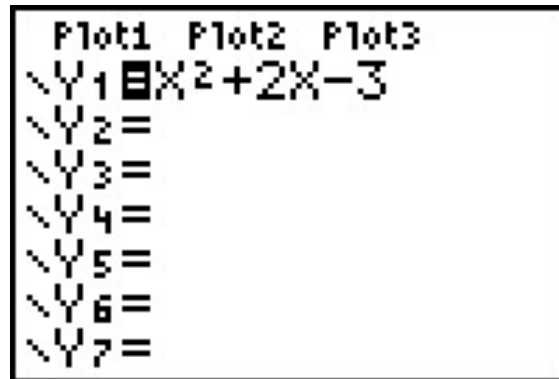
Find the y-intercept for $y = x^2 + 2x - 3$

Solution:

$(0, -3)$

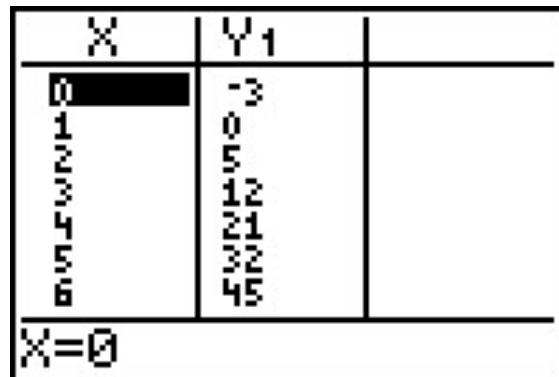
Calculator Steps:

- Push , , , , , , , , 



Plot1	Plot2	Plot3
$Y_1 = X^2 + 2X - 3$		
$Y_2 =$		
$Y_3 =$		
$Y_4 =$		
$Y_5 =$		
$Y_6 =$		
$Y_7 =$		

- Push , 
- Scroll up/down using the arrows to the y-intercept



X	Y1	
0	-3	
1	0	
2	5	
3	12	
4	21	
5	32	
6	45	
X=0		

Graphing Inequalities

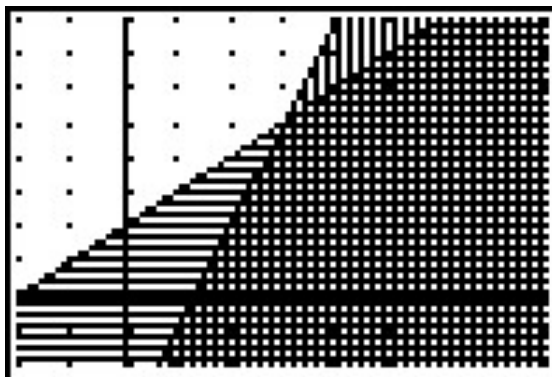
Sample Problem:

Graph the solution of the system of linear inequalities:

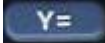
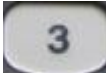
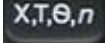



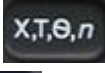






$$y < 3x - 4$$

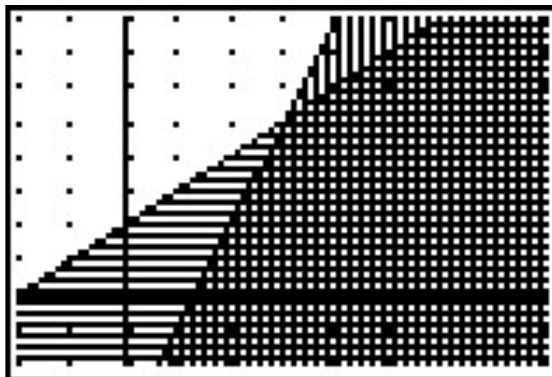
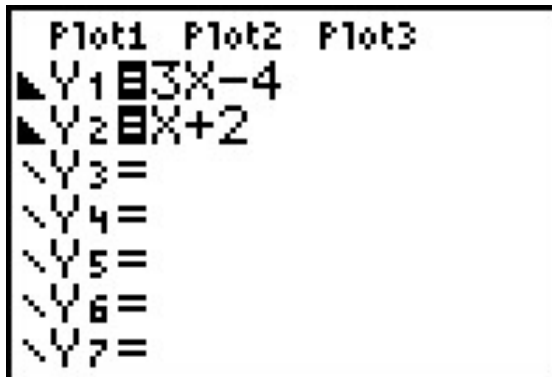
$$y \leq x + 2$$

Solution:



Calculator Steps:

- Push , , , , , 
- Push , , , 
- Move the cursor to the left of Y_1 and push  3 times.
- Move the cursor to the left of Y_2 and push  3 times.
- Push 

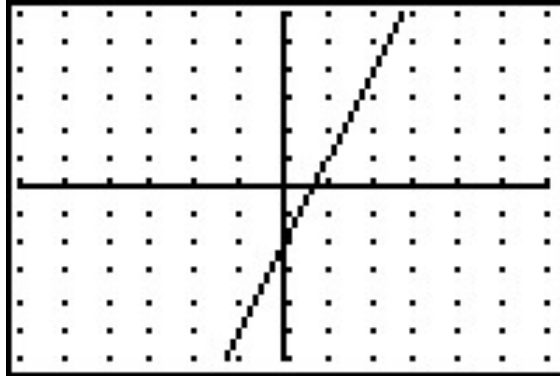


Graphing Lines

Example Problem:

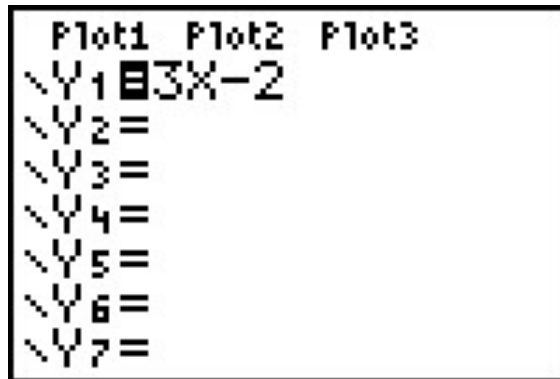
Graph $y = 3x - 2$

Solution:

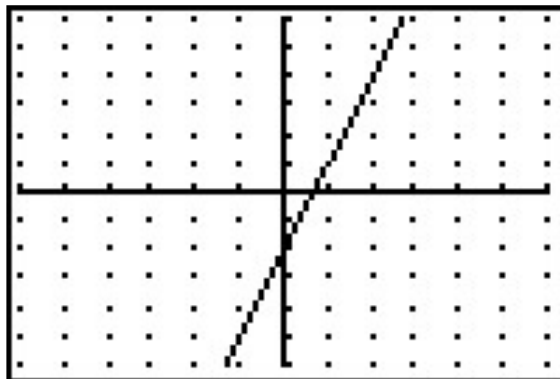


Calculator Steps:

- Push **Y=**, **3**, **X,T,θ,n**,
-, **2**, **ENTER**

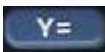

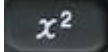

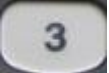

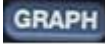


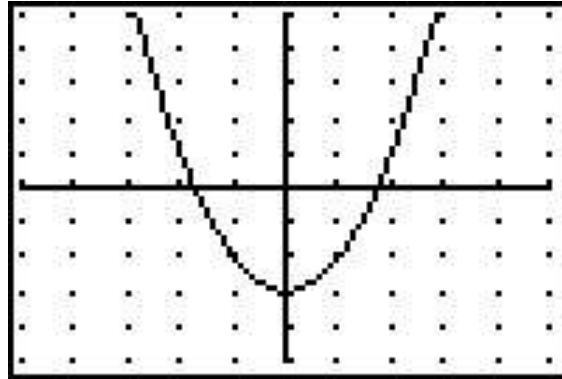
- Push **GRAPH**




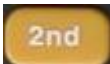




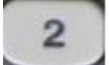

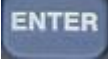

Graphing Non-Linear Equations

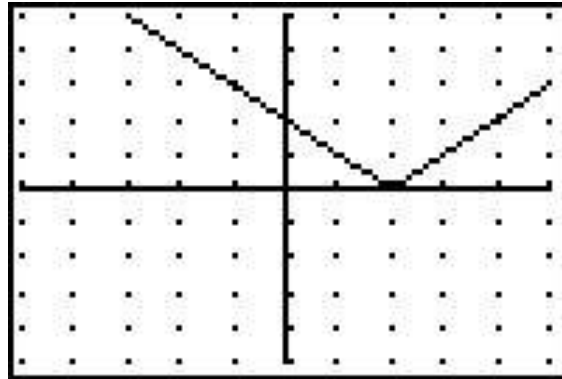
- Graph $y = x^2 - 3$

- Push , , ,
- , , ,
- Push 



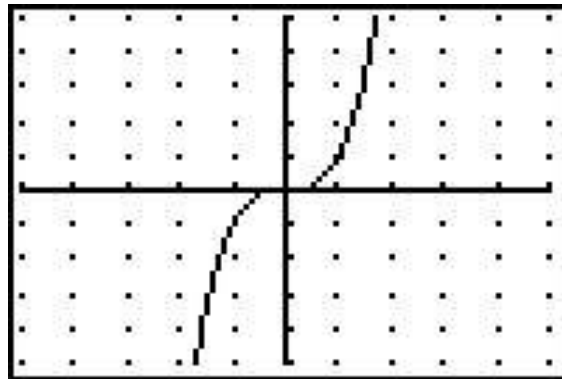
- Graph $y = |x - 2|$

- Push , , ,
- , , ,
- , , ,
- Push 



- Graph $y = x^3$

- Push , , ,
- ,
- Push 



Higher Order Roots

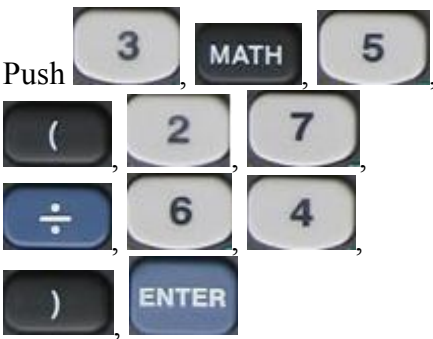

Sample Problem:

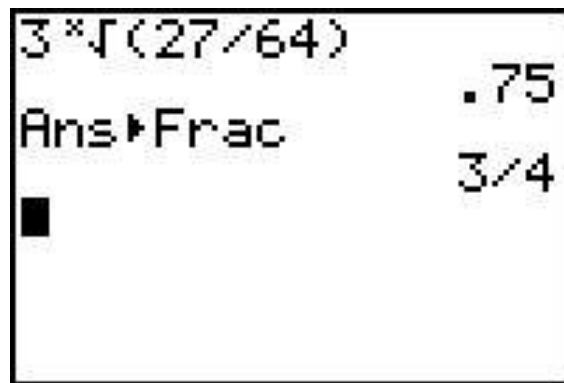
Evaluate $\sqrt[3]{\frac{27}{64}}$

Solution:

$$\frac{3}{4}$$

Calculator Steps:

- Push 
- Push 

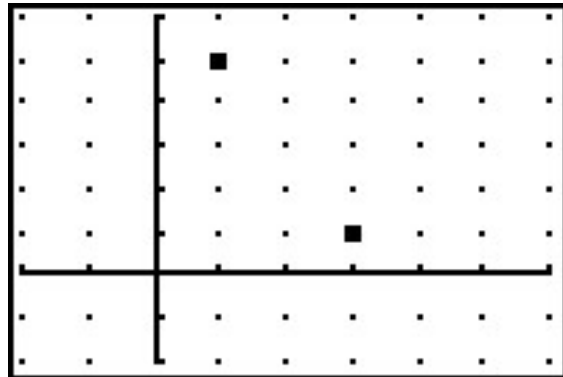


Plotting Ordered Pairs

Example Problem:

Plot: $(1,5)$, $(3,1)$

Solution:



Calculator Steps:

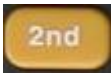



- Push , 

```

EDIT  CALC TESTS
1: Edit...
2: SortA(
3: SortD(
4: ClrList
5: SetUpEditor
  
```

- Type in the ordered pairs (x's in L_1 and y's in L_2)

L1	L2	L3	2
1 3 -----	5 1 -----	-----	
L2(3) =			

- Push , , 
- Select the options as pictured by  using the arrows and the button.

```

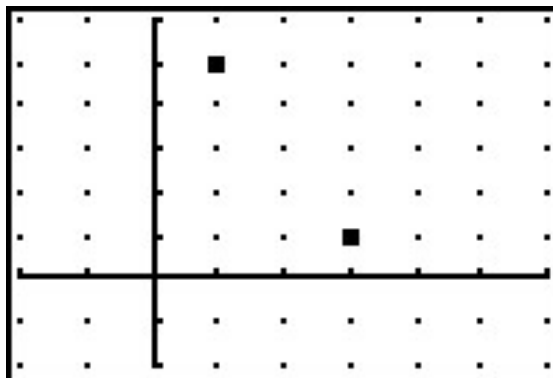
ZOOM  Plot2 Plot3
Off
Type: [ ] [ ] [ ]
      [ ] [ ] [ ]
Xlist: L1
Ylist: L2
Mark: [ ] + .
  
```

- Push 
- Select a Window that will display the ordered pairs.

```

WINDOW
Xmin=-2
Xmax=6
Xscl=1
Ymin=-2
Ymax=6
Yscl=1
Xres=1
  
```

- Push **GRAPH**



Scientific Notation

Sample Problem:

Write 45,000,000,000 in scientific notation.

Solution:

$$4.5 \times 10^{10}$$

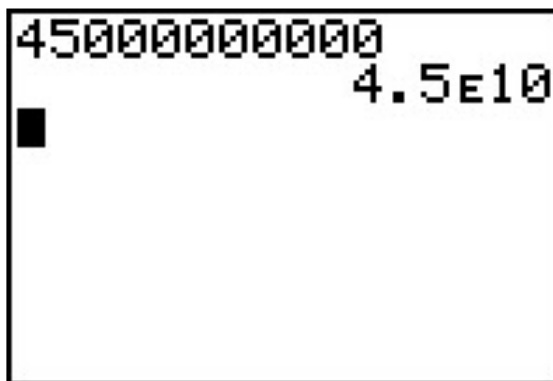
Calculator Steps:

Put calculator in Scientific Mode

- Push **MODE**
- Scroll right and push **ENTER** on “Sci”



- Push **2nd**, **MODE**
- Push 45000000000, **ENTER**



Solving Systems by Graphing

Example Problem:

Given $y = x + 1$ and $y = 2x - 1$, find the solution to the system of equations.

Solution:

(2,3)

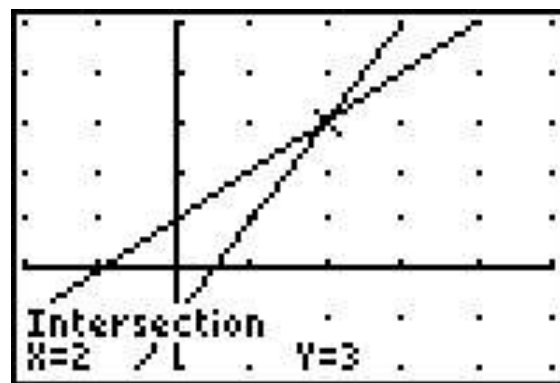
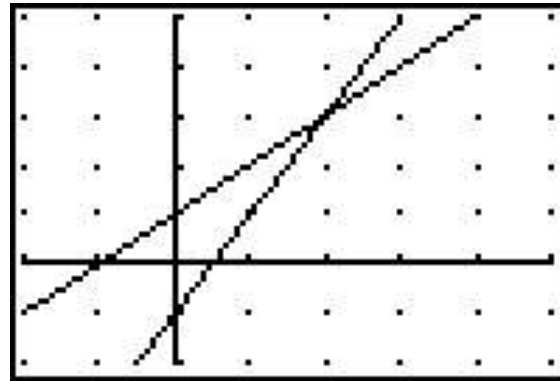
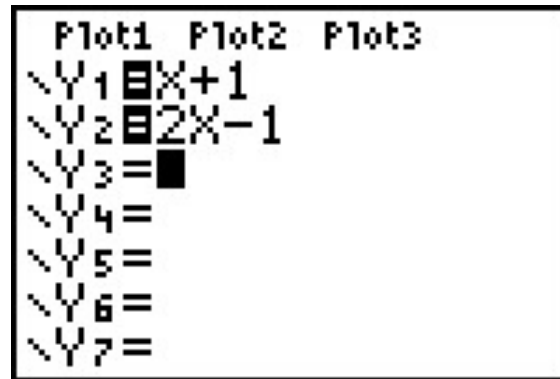
Calculator Steps:

- Push $\boxed{Y=}$, $\boxed{X,T,\theta,n}$, $\boxed{+}$, $\boxed{1}$, \boxed{ENTER}

- Push $\boxed{2}$, $\boxed{X,T,\theta,n}$, $\boxed{-}$, $\boxed{1}$, \boxed{ENTER}

- Push \boxed{GRAPH}
- You have to see the intersection on the graph to get the answer.

- Push $\boxed{2nd}$, \boxed{TRACE} , $\boxed{5}$, \boxed{ENTER} , \boxed{ENTER} , \boxed{ENTER}



The ordered pair will be stated on the screen.

Using Y= to Help with Factoring using Grouping or the Box

Sample Problem:


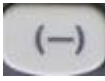

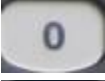



Factor $3x^2 + 13x - 10$

Solution:

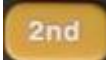

$(3x - 2)(x + 5)$

Calculator Steps:

Goal: To find 2 numbers that have a product of -30 and a sum of 13.

- Push, , , , , , , 

Plot1	Plot2	Plot3
Y1 =	-30/X	
Y2 =		
Y3 =		
Y4 =		
Y5 =		
Y6 =		
Y7 =		

- Push , 
- Scroll up and down the table until you find 2 numbers that total 13.

X	Y1	
15	15	
30	30	
ERROR	ERROR	
-30	-30	
-15	-15	
-10	-10	
-7.5	-7.5	
X = -2		

These are the numbers needed to factor by grouping or to use the box.