

TI Lab 1: Useful Stuff

IN THIS LAB, YOU WILL: EVALUATE FUNCTIONS FROM THE HOME SCREEN;
 ENTER LISTS FROM THE HOME SCREEN;
 CHANGE THE GRAPHING STYLE;
 DISPLAY A GRAPH AND ITS TABLE SIDE-BY-SIDE;
 SET UP THE TABLE USING VALUES YOU DETERMINE.

1. Enter $Y1=X^3-4X$ and graph this on the standard “10 by 10” window. To find the value of y when $x = 1$, you can do one of three things:

- From the **CALC** menu, choose **value**, press 1, then press **ENTER**;
- Press **TRACE**, press 1, then press **ENTER**;
- Go back to the home screen, and enter $Y1(1)$.

(To type $Y1$ on the home screen, you must choose this from the Variable menu: press **VARS**, go to the **Y-VARS** menu, choose **1:Function...** and $Y1$ is the first option. Notice all other Y variables are listed there.)

a) Using the home screen entry method, find $Y1(3)$.

This method has its advantages. Enter $Y2=X^2$. Now you can evaluate the composition of two (or more!) functions.

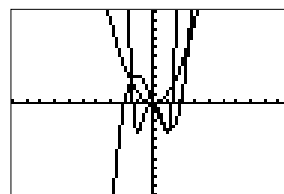
b) Evaluate $Y1(Y2(-2))$ and $Y2(Y1(-2))$.

You can also graph the composition of functions.

c) Enter $Y3=Y1(Y2(X))$ and graph it, along with $Y1$ and $Y2$.

```
Y1(3)          15
Y1(Y2(-2))     48
```

```
Plot1 Plot2 Plot3
Y1=X^3-4X
Y2=X^2
Y3=Y1(Y2(X))
Y4=
Y5=
Y6=
Y7=
```



2. All three functions from Problem 1 part (c) are hard to make out when they are graphed on the same screen. Luckily, your calculator allows varying graph styles so you can determine which curve is which. They are

Normal style
 Bold style
 Shade above the graph
 Shade below the graph
 Trace and leave a trail
 Trace but don't leave a trail
 Dotted

```
Plot1 Plot2 Plot3
Y1=
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
```

To change from one style to the other, position the cursor over the current style and press enter repeatedly until the style you want appears.

Using the functions from Problem 1 part (c), change $Y2$ to dot style and $Y3$ to bold style. Graph them again.

3. Like evaluating functions, lists do not have to be entered through the STAT EDIT menu—they can be entered from the home screen. To enter the numbers -3 , 1 , and 2 into a list, store it as List 1 by typing $\{-3,1,2\} \rightarrow L1$. The \rightarrow symbol (which means “store into”) is made by pressing the STO key. An advantage of this is that functions can be evaluated using lists. To evaluate $Y1$ at three points $x = -3$, $x = 1$, and $x = 2$, simply enter the x -values in $L1$ and then enter $Y1(L1)$. You may also enter the list directly, without storing it by typing $Y1(\{-3,1,2\})$.

You may also perform normal arithmetic operations on lists. Evaluate the function in $Y3$ at the points -2 , 0 , 3 , and 5 using a list.

```
{-3,1,2}→L1
      {-3 1 2}
Y1(L1)
      {-15 -3 0}
Y1({-3,1,2})
      {-15 -3 0}
```

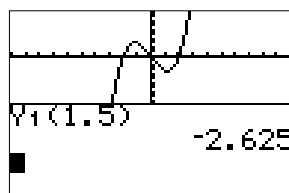
```
{-5,2,13}→L1
      {-5 2 13}
L1^2
      {25 4 169}
-4L1
      {20 -8 -52}
```

4. Clear $Y2$ and $Y3$. Sometimes it is convenient to view both a graph and its table. To view both $Y1$ and its table, press the **MODE** button and move to the last row. There are three options: **Full**, **Horiz**, **G-T**. (**Full** should already be highlighted.) Move the cursor to **G-T** and press **ENTER** to highlight it. Then press **GRAPH**. You should see the screen split vertically, with the graph on the left and the table on the right.

Pressing **TRACE** matches the table with the values from the graph. Like any other graph or table, you may change the window, set up the table, or zoom just as before.

To view the graph and still perform operations on the home screen, change the mode to **Horiz**. Then the screen is split horizontally, with the graph on the top and the home screen on the bottom.

$Y1=X^3-4X$	X	$Y1$
	0	0
	.4348	-1.66
	.8696	-2.82
	1.304	-3
	1.739	-2.7
	2.173913	-2.609
$X=2.173913$ $Y=1.5780389$		



5. Finally, if you want specific values in your table, you may enter them manually, and the table will show only those values! This is done by selecting **Ask** on the **Indpnt** line in the **TBLSET** menu. Once **Ask** is selected, pressing **TABLE** allows you to enter whatever x -values you want to fill your table.

```
TABLE SETUP
TblStart=0
ΔTbl=1
Indpnt: Auto Ask
Depend: Y1
```

X	$Y1$
2	0
-3.5	-28.88
12	1680
6	192

6. To graph a piecewise function like $f(x) = \begin{cases} -2x & x < -2 \\ x^3 + 1 & -2 \leq x < 1 \\ x - 6 & x \geq 1 \end{cases}$, you must enter the each piece divided by each condition on a separate line. The greater and less than symbols are located in the **TEST** menu (2nd **MATH**). The figures below show the function and its graph.

```
P1ot1 P1ot2 P1ot3
\Y1= (-2X)/(X<-2)
\Y2=(X^3+1)/(X<=
-2)/(X<1)
\Y3=(X-6)/(X≥1)
\Y4=
\Y5=
```

