Exploring transformations with the TI-84 Plus CE graphing calculator Dr. Richard Parr (rparr@rice.edu) Rice University School Mathematics Project (http://rusmp.rice.edu)

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NORMAL	FLOAT	AUTO	REAL	RADIAN	MP
Plot1	P1ot	2 P	lot3		
NY 1E	Х				
NY 2	Y1 ()	()+3	1		
■ \ ¥3=	=				
NY 4=	=				
■NY 5=	=				
NY 6=	=				
NY 7=	=				
NY 8=	=				
■ \ Y 9=	=				

Compare the graphs and tables of Y_1 = X and Y_2 = Y_1 (X) +3. What is the function that is being graphed in Y_2 ?

How are the graphs the same?

How are the graphs different?



Compare the tables. What do you notice?

Change the value of 3. Try positive and negative numbers. What do you notice in the tables and graphs?

PRESS +	FOR ATE1	JIU KEHL	KHUINN	rir 	
Х	Y1	Y2			
0	0	3			\Box
1	1	4			
2	2	5			
3	3	6			
4	4	7			
5	5	8			
6	6	9			
7	7	10			1
8	8	11			
9	9	12			
10	10	13			

Change Y_1 to $Y_1=X^2$. (Leave Y_2 the same). What is the function that is being graphed now in Y_2 ?

Compare graphs and tables. What do you notice?

Change Y_1 to any other function that you wish. Any surprises?

NORMAL	FLOAT	AUTO	REAL	RADIAN	MP	Î
Plot1	Plot	2 P'	lot3			
NY 1E	Х					
■NY 2E	-Y1((X)				
■ \ ¥3=	=					
NY4=	=					
■ \ ¥5=	=					
Y 6=	=					
■ \Y 7=	=					
Y 8=	=					
• Y 9=	=					

Compare the graphs and tables of Y_1 = X and Y_2 =- Y_1 (X). What is the function that is being graphed in Y_2 ?

How are the graphs the same?

How are the graphs different?



Compare the tables. What do you notice?

Change Y_1 to $Y_1=X^2$. (Leave Y_2 the same). What is the function that is being graphed now in Y_2 ?

Compare graphs and tables. What do you notice?

X	Y1	Y 2		
0	0	0		
1	1	-1		
2	2	-2		
3	3	-3		
4	4	-4		
5	5	-5		
6	6	-6		
7	7	-7		
8	8	-8		
9	9	-9		
10	10	-10		

Change Y_1 to any other function that you wish. Any surprises?

NORMAL	FLOAT	AUTO	REAL	RADIAN	MP	Î
Plot1	Plot	2 P	lot3			
NY 1E	X ²					
NY 2E	12Y1 (
NY 4=						
NY 5=	-					
NY 6=						
Y 7=	-					
- ,10						

Compare the graphs and tables of $Y_1 = X$ and $Y_2 = 2Y_1(X)$. What is the function that is being graphed in Y_2 ?

How are the graphs the same?

How are the graphs different?



Compare the tables. What do you notice?

Change the value of 2. Try positive and negative numbers. What do you notice in the tables and graphs?

X		Y2		T
Û	0	2		+
1	1	5		
2	2	8		
3	3	11		
4	4	14		
5	5	17		
6	6	20		
7	7	23		
8	8	26		
9	9	29		
10	10	32		

Change Y_1 to $Y_1=X^2$. (Leave Y_2 the same). What is the function that is being graphed now in Y_2 ?

Compare graphs and tables. What do you notice?

Change Y_{1} to any other function that you wish. Any surprises?

NORMAL FLOAT AUTO REAL RADIAN MP
Plot1 Plot2 Plot3
NY18X
■NY2■Y1(X-2)
■NY3=
■NY4=■
■NY5=
NY6=
NY 7=
NY 8=
Y 9=

Compare the graphs and tables of Y_1 = X and Y_2 = Y_1 (X-2). What is the function that is being graphed in Y_2 ?

How are the graphs the same?

How are the graphs different?



Compare the tables. What do you notice?

Change the value of -2. Try positive and negative numbers. What do you notice in the tables and graphs?

NORMAL Press + F	FLOAT AL Or atb1	ITO REAL	RADIAN	MP	
X	Y1	Y 2			
0	0	-2			
1	1	-1			
2	2	0			
3	3	1			
4	4	2			
5	5	3			
6	6	4			
7	7	5			
8	8	6			
9	9	7			
10	10	8			
X=0					

Change Y_1 to $Y_1=X^2$. (Leave Y_2 the same). What is the function that is being graphed now in Y_2 ?

Compare graphs and tables. What do you notice?

Change Y_{1} to any other function that you wish. Any surprises?

NORMAL	FLOAT	AUTO	REAL	RADIAN	MP	Î
Plot1	Plot	2 P'	lot3			
NY 1E	х					
NY 2	3Y1([X+2)-4			
■ \ ¥3=	=					
NY4=	=					
■NY 5=	-					
Y 6=	=					
NY 7=	=					
NY 8=	-					
• Y 9=	-					

Compare the graphs and tables of Y_1 = X and Y_2 =3 Y_1 (X+2) -4. What is the function that is being graphed in Y_2 ?

How are the graphs the same?

How are the graphs different?



Compare the tables. What do you notice?

Change Y_1 to $Y_1=X^2$. (Leave Y_2 the same). What is the function that is being graphed now in Y_2 ?

Compare graphs and tables. What do you notice?

X	Y1	Y2		
Ø	0	2		
1	1	5		
2	2	8		
3	3	11		
4	4	14		
5	5	17		
6	6	20		
7	7	23		
8	8	26		
9	9	29		
10	10	32		

Change Y_{1} to any other function that you wish. Any surprises?

NORMAL Transfo	FLOAT AL RMATION	JTO REAL Graphin	RADIAN MP G APP	
Plot1	Plot2	Plot3	QUIT-APP	
∎NY1∎	AX+B			
■>1Y2=				
∎>#Y3=				
∎MY4=				
∎>#¥5=				
■•••¥6=				
■>IIY 7=				
■>NY8=				
■MY9=				

Investigate the TRANSFORMATION app on the TI-84

Change the settings and explore transformations on the parent function.

What are the effects of A and B?

NORMAL FLOAT AUTO REAL RADIAN MP Transformation graphing app	
WINDOW SETTINGS	
AB2	
Step=1	

