Making Connections in Mathematics with Graphing Calculators and Children's Literature

NCTM Baltimore Regional Conference
Friday, October 18, 2013
Session 211
2:30 p.m. - 4:00 p.m.
Peale A, B, C

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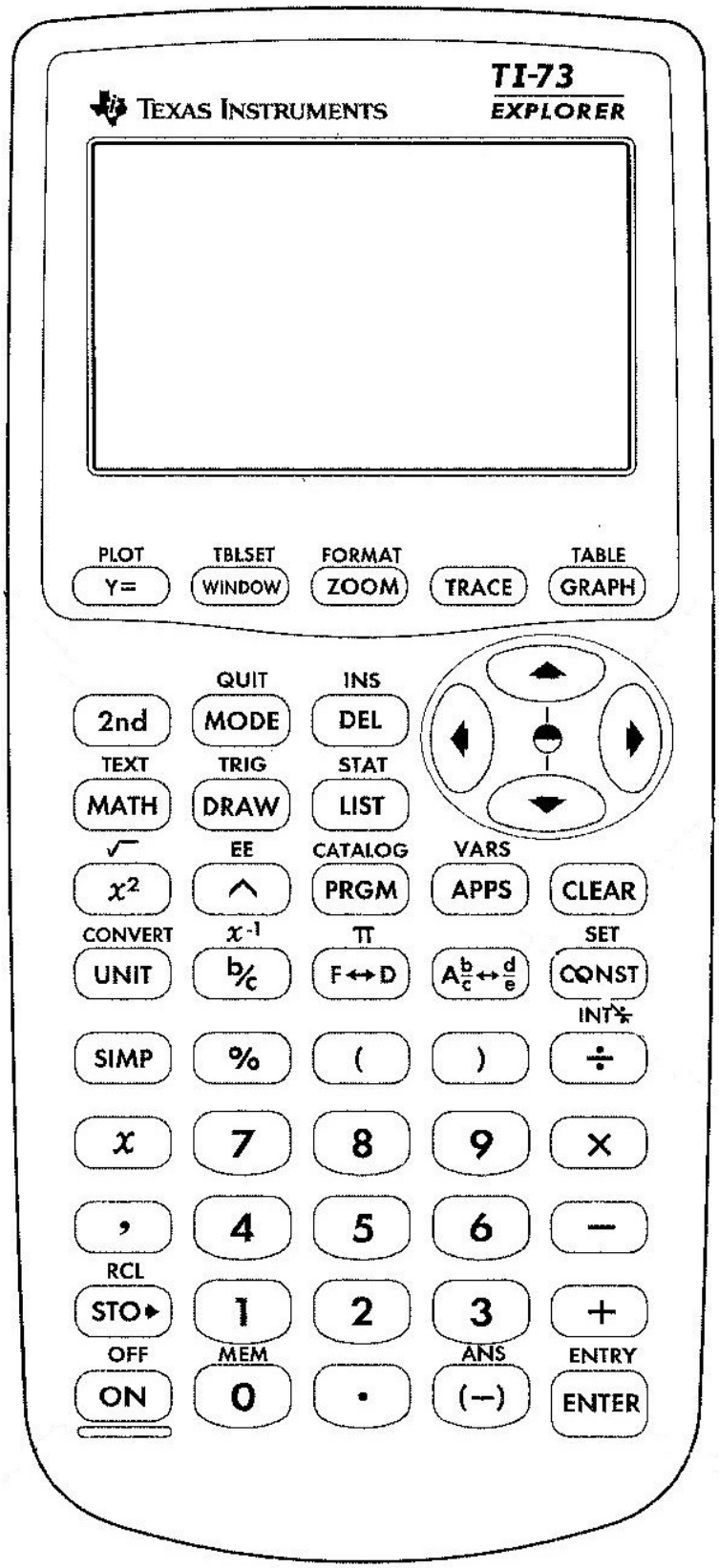
TEXAS INSTRUMENTS
TI-73
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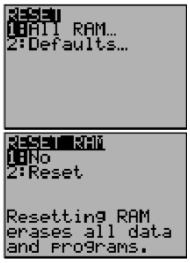
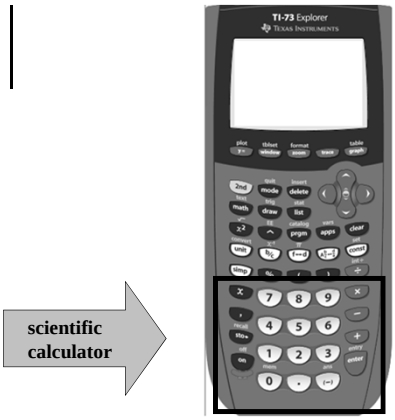
To clear all memory

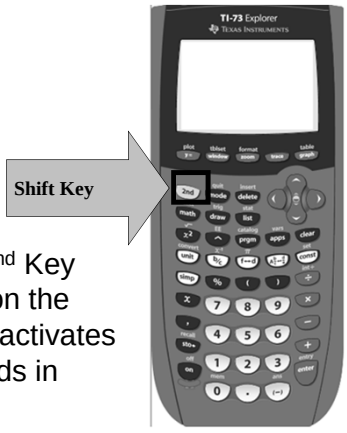
- Press 2nd MEM (0 key)
- Select choice 7. Reset

- Select 1. ALL RAM to erase all information that may have been added to the calculator.
- This restores the calculator to the condition of being a new calculator straight out of a package. (Programs will also be erased.)
- You will be given one warning screen to make sure you do want to erase all the memory.

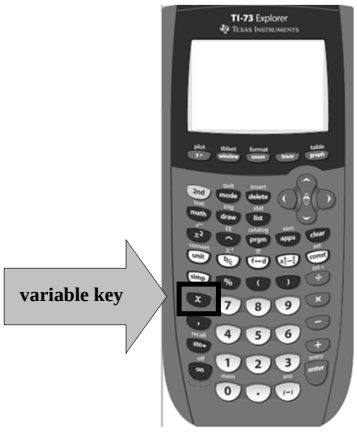


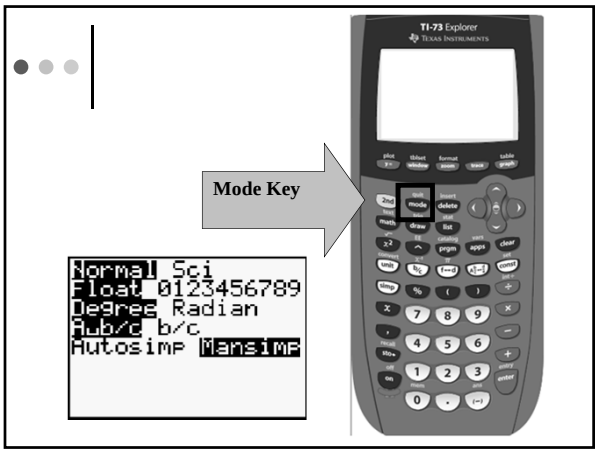
- When you have reset all the memory you will get a screen that says that.

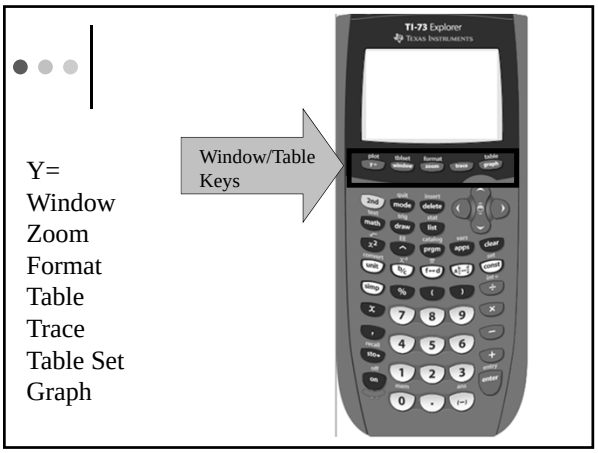


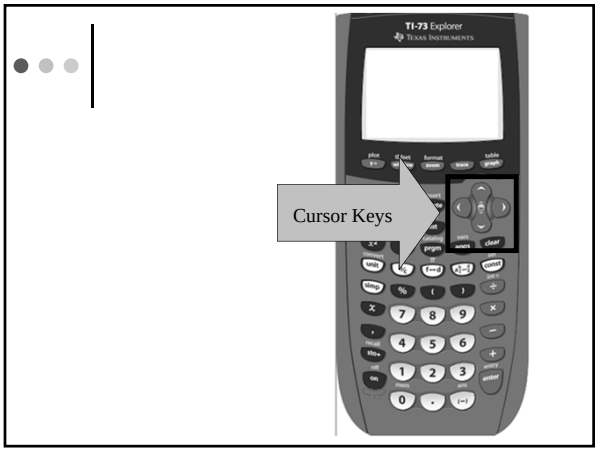


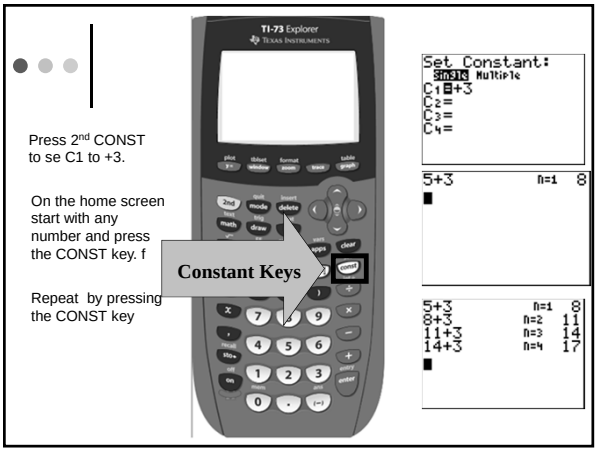
Using the 2nd Key places an on the screen and activates all commands in **YELLOW.**

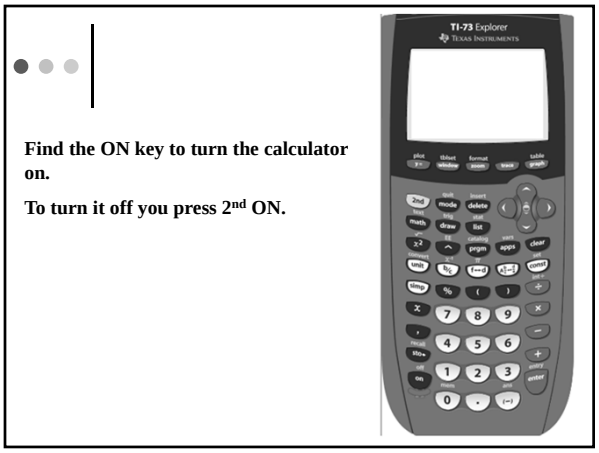






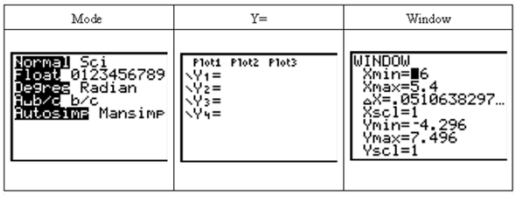






Some Basic Graphing Calculator Skills

- **Keys to check before you begin any type of work on your graphing calculator**



Input-Output Table

Function	
Input	Output

Collecting Data

Name of Book:_____

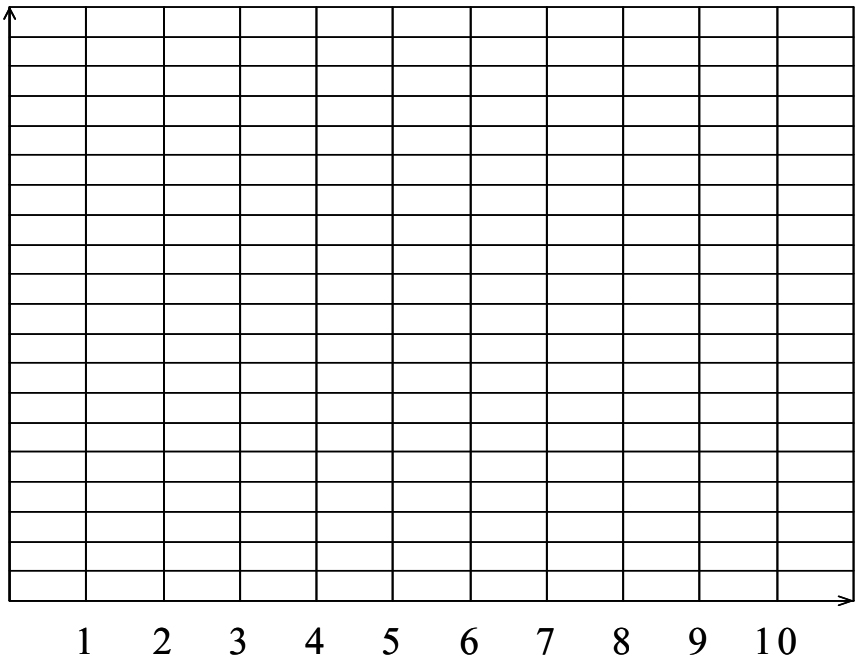
Author:_____

x =_____

y =_____

Equation: _____

INPUT	OUTPUT



OBSERVATIONS:

Collecting Data

Name of Book:_____

Author:_____

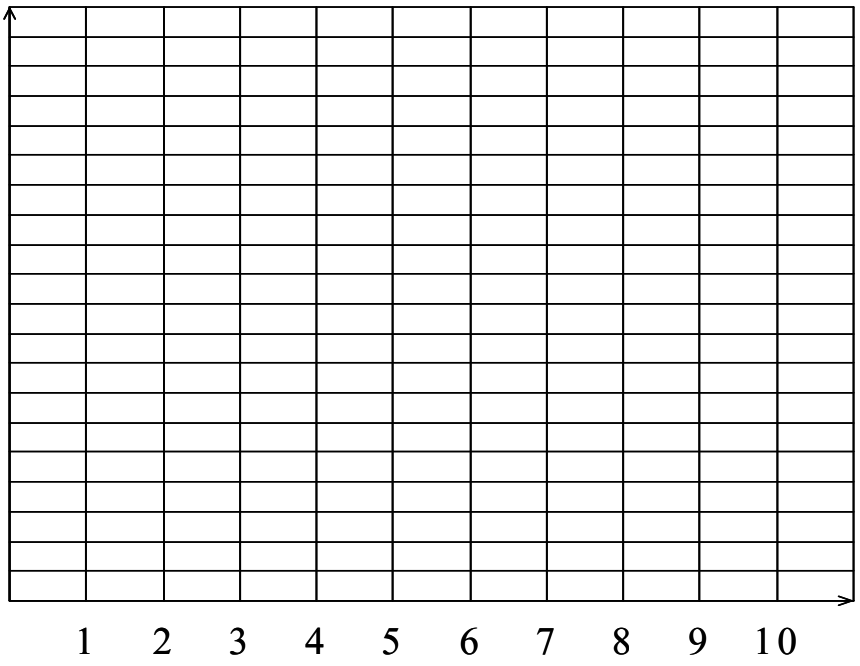
x =_____

y =_____

Equation:

_____

INPUT	OUTPUT



OBSERVATIONS:

Collecting Data

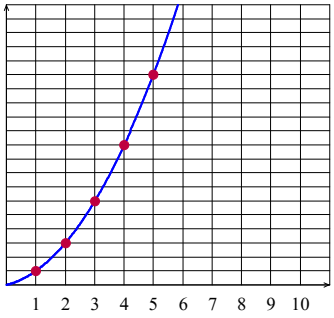
Name of Book: The 12 Circus Rings
Author: Seymour Chwast

x = number of the circus rings

Equation: $y = \frac{1}{2}(x)(x+1)$

y = number of circus performers (people and animals) performing in the ring

INPUT	OUTPUT
1	1
2	3
3	6
4	10
5	15
6	21
7	28



OBSERVATIONS:
Rate of change is not constant.
Graph is not linear.
Number of performers and animals is ½ the product of the current ring number and the next ring number.
Number of performers and animals is increasing by consecutive integers.

Collecting Data

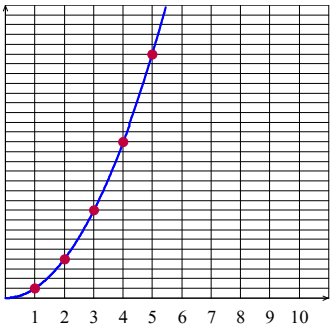
Name of Book: Bats on Parade
Author: Kathi Appelt

x =section number of band (drum majorette is section 1, etc.)

Equation: $y = x^2$

y = number of bats in section x of the marching band

INPUT	OUTPUT
1	1
2	4
3	9
4	16
5	25
6	36
7	49



OBSERVATIONS: Rate of change is not constant.
Graph is not linear.
Number of bats is the square of the section number.
Number of bats is increasing by consecutive integers.

Collecting Data

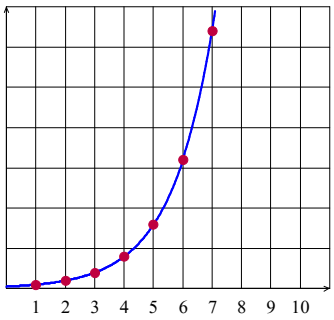
Name of Book: Double the Wheels
Author: Nancy Raines Day

x = number of times the wheels have doubled

Equation: $y = 2^{x-1}$

y = number of wheels

INPUT	OUTPUT
1	1
2	2
3	4
4	8
5	16
6	32
7	64



OBSERVATIONS:
The rate of change is not constant.
The graph is not linear.
Each output is a product of 2's ($2^0, 2^1, 2^2, , 2^3, etc.$). The number of 2's in the product is one less than the number of times the wheels has been doubled.

Collecting Data

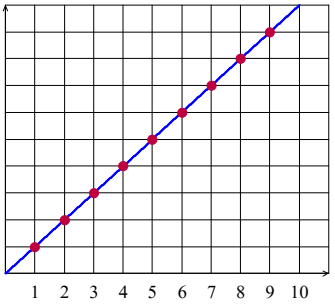
Name of Book: One Watermelon Seed
Author: Celia Barker Lottridge

x = number of different type of seeds/plants planted

Equation: $y = 10x$

y = total number of pieces of produce harvested

INPUT	OUTPUT
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100



OBSERVATIONS: The rate of change is constant. The graph rises 10 every time the input increases.
The graph is linear.
Every output is 10 times the input.

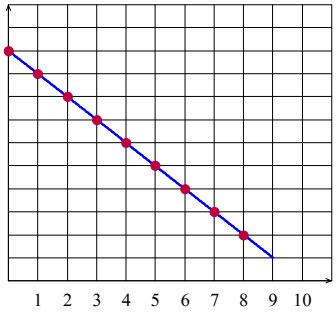
Collecting Data

Name of Book: Ten Red Apples
Author: Pat Hutchins

x = number of red apples in the tree after one of the animals has eaten an apple.
y = total number of apples in the tree

Equation: $y = 10 - x$

INPUT	OUTPUT
0	10
1	9
2	8
3	7
4	6
5	5
6	4
7	3
8	2
9	1



OBSERVATIONS: The graph is decreasing.
The rate of change is constant. The graph is linear.
The graph decreases 1 every time the input increases.
Every output is 10 times the input.
The inputs are restricted to whole numbers 0-9.

Collecting Data

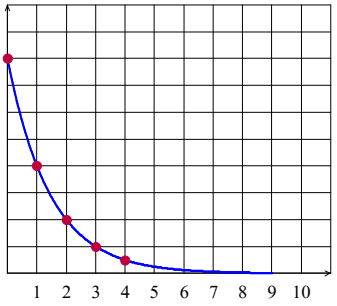
Name of Book: The Great Divide
Author: Dayle Ann Dodds

x = number of obstacles (or number of splits or the number of divides) through the 4th obstacle

y = total number of racers in the race

Equation: $y = \frac{80}{2^x}$

INPUT	OUTPUT
0	80
1	40
2	20
3	10
4	5



OBSERVATIONS:
The rate of change is not constant. The graph is not linear. The graph is decreasing.
Each previous output is divided by 2.
The inputs are restricted to the whole number 0-4.

Collecting Data

Name of Book: The Great Divide
Author: Dayle Ann Dodds

x = number of legs in the race through the 6th leg

y = total number of racers in the race

Equation: $y = \frac{80}{2^{x-1}}$

INPUT	OUTPUT
1	80
2	40
3	20
4	10
5	5

OBSERVATIONS:
The rate of change is not constant. The graph is not linear. The graph is decreasing.
Each previous output is divided by 2.
The inputs are restricted to the whole number 0-4.

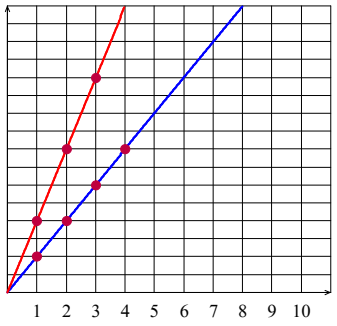
Collecting Data

Name of Book: Counting Sheep
Author: Dr. Julie Glass

x = number of times the boy counts the animals
a=number of animals in the group
y = number of animals counted

Various equations can be created: $y = ax$

INPUT	OUTPUT
1	a
2	2a
3	3a
4	4a
5	5a



OBSERVATIONS:
The rate of change is constant. The graph is linear.
The steepness of the graph depends on the number of animals in the group.
Every output is a times the input.

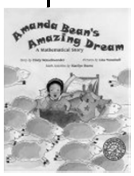
Incorporating Literature with the TI-73

- *Two of Everything* by Lily Toy Hong

Looking at Other Literature with Functions Connections

- Counting on Frank by Rod Clement, Gareth Stevens Publishing, 1991 (jrr)

- Alice in Pastaland-A Math Adventure by Alexandra Wright, Charlesbridge Publishing, 1997 (jrr)



- Amanda Bean's Amazing Dream by Cindy Neuschwander, Scholastic Books, 1998 (jrr)

- The Greedy Triangle by Marilyn Burns, Scholastic Books, 1994 (jrr)

- Anno's Mysterious Multiplying Jar by Masaichiro and Mitsumasa Anno, Philomel Books, 1983 (jrr)

- Counting on Frank by Rod Clement Gareth Stevens Publishing 1991 (jrr)

Various Functions

- Alice in Pastaland – A Math Adventure by Alexandra Wright Charlesbridge Publisher, 1997 (jrr)

- Amanda Bean's Amazing Dream – A Mathematical Story by Cindy Neuschwander