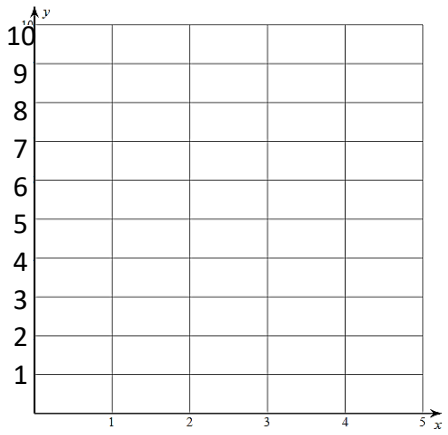
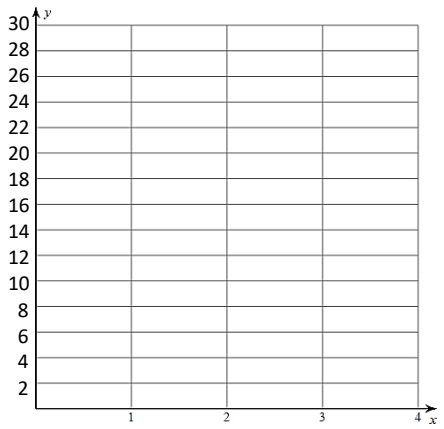
Name _____ Date _____

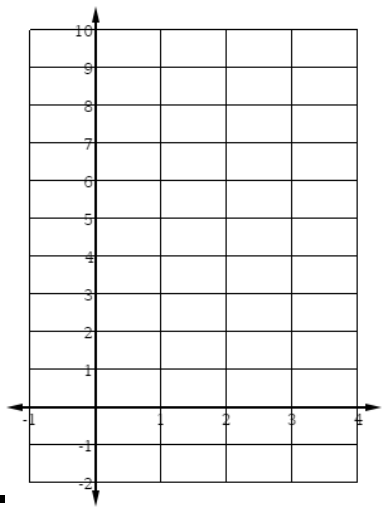
Comparing Linear and Exponential Equations

	Linear	Exponential
General Form	**$f(x) = mx + b$**	**$f(x) = a(b)^x$**
Example	**$f(x) = 2x + 3$**	**$f(x) = 3(2)^x$**
y-intercept		
Describe the Change (Do we add or subtract, multiply or divide? By how much?		
Table (Use your calculator to complete the table)	**x** | **f(x)** **0** **1** **2** **3**	**x** | **f(x)** **0** **1** **2** **3**
Graph		
Write a Story to represent the example. Be creative, but be sure to include the y-intercept and the change.		

Which function increases faster, $f(x) = 2x + 1$ or $g(x) = 2^x - 1$? Make a table of values to help you decide.

x	f(x) = 2x + 1
-1	
0	
1	
2	
3	
4	

x	g(x) = 2^x - 1
-1	
0	
1	
2	
3	
4	



Where will the two functions intersect?

Compare each pair of functions based on their rate of change or y-intercept. Shade the correct statement at the bottom of each box in green.

1. Function 1:

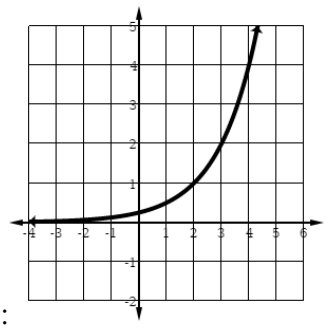
x	y
-6	0
-5	3
-4	6
-3	9

Function 2:

$y = 5x - 7$

Function 2 has a greater rate of change.	Function 1 and Function 2 have the same rate of change.

2. Function 1:



Function 2:

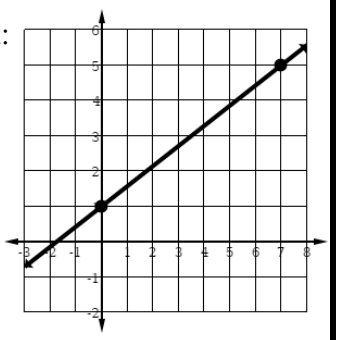
$y = \frac{1}{2}x + 1$

Function 1 has a greater rate of change on the interval [2,4]	Function 2 has a greater rate of change on the interval [2,4]

3. Function 1:

x	2	9	16	23
y	0	4	8	12

Function 2:



Function 2 has a greater rate of change.	Function 1 and Function 2 have the same

4. Function 1:

$y = 3(2)^x$

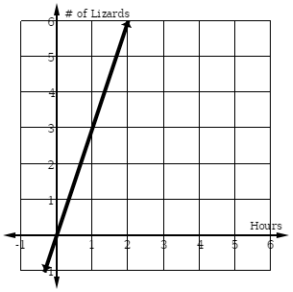
Function 2:

x	y
-1	1/3
0	1
1	3
2	9
3	27

Function 1 has a higher y-intercept.	Function 2 has a higher y-intercept.

5. Will and Keller caught lizards at a constant rate throughout the day. The lizards Will caught are represented by the graph below. The lizards Keller caught is represented in the table. Who caught lizards at a slower rate?

Will's Lizards



Keller's Lizards

Hours	0	1	3	5
# of Lizards	0	2	6	10

Will caught lizards at a slower rate	Keller caught lizards at a slower rate.

6. Dr. Nelson's students are working on a lab in AP Bio. Group A started with 2430 fruit flies, which are dying by a third each day. Group B started with 1800, which are dying by 300 each day. Which one decreased at a faster rate during Day 1 to Day 3? Which one decreased at a faster rate during Day 4 to Day 5? (Hint: write an equation and create a table)

Group A's die at a faster rate Day 1 - 3.	Group B's die at a faster rate Day 1 - 3.
Group A's die at a faster rate Day 4 - 5.	Group B's die at a faster rate Day 4 - 5.

7. For each representation below, determine if they are linear or exponential, and then write the equations.

Problem 1, Function 1	Problem 3, Function 2	Problem 4, Function 2
Linear or Exponential?	Linear or Exponential?	Linear or Exponential?
f(x) =	f(x) =	f(x) =

8. What is the key in determining if a scenario is linear or exponential? Circle ALL of the exponential representations above in blue, and put a box around the linear representations in red.