Name: _____ Date: _____

LINEAR VERSUS EXPONENTIAL

Linear and exponential functions share many characteristics. This is because they are based on two different, but similar, sets of principles.

***Do Now*:** The two tables below represent a linear function and an exponential function. Which is which? Explain how you arrive at your answer.

TABLE 1

x	0	1	2	3	4
y	5	10	20	40	80

×2 ×2 ×2

Growth Factor

EXPONENTIAL

TABLE 2

x	0	1	2	3	4
y	8	11	14	17	20

+3 +3 +3

LINEAR

LINEAR VERSUS EXPONENTIAL

Linear functions are based on **repeatedly** adding/subtracting the same amount (the slope).

Exponential functions are based on **repeatedly** multiplying/dividing by the same amount (the base).

***Exercise* #2:** Find equations in standard form for each of the functions from *Exercise* #1.

(a) Table 1

Initial Value

$y = a(b)^x$

$y = 5(2)^x$ Growth Factor

(b) Table 2

$y = mx + b$

$y = 3x + 8$

It is interesting that linear and exponential functions are ones where two points on the curve will always determine the equation of the curve.

***Exercise* #3:** Consider the two points $(0, 12)$ and $(1, 3)$. Create a linear equation that passes through these points in $y = mx + b$ form and an exponential equation in $y = a(b)^x$ form that also passes through them. Then, using your calculator, graph both using a **WINDOW** of $-2 \le x \le 2$ and $-5 \le y \le 15$.

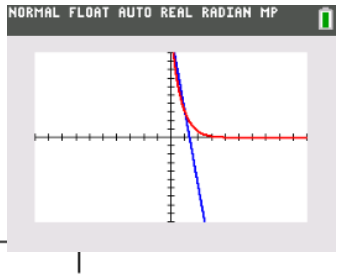
x	0	1
y	12	3

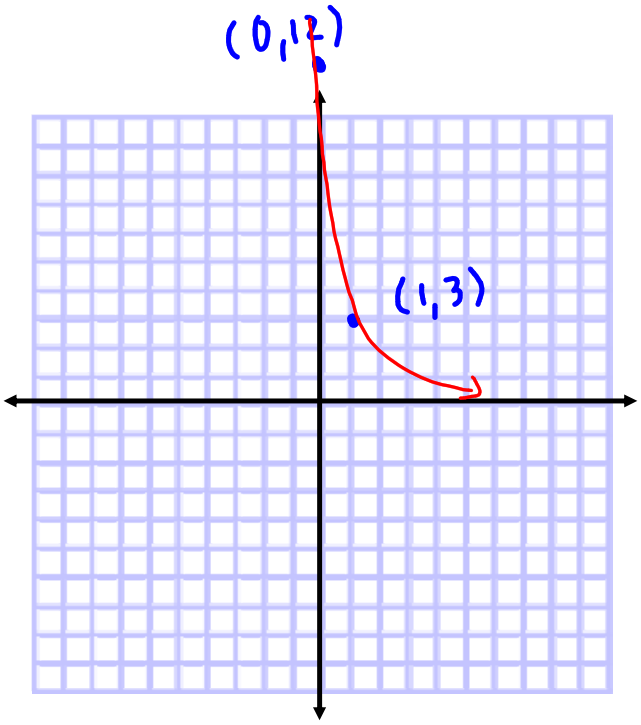
$y = mx + b$

$y = -9x + 12$

$y = a(b)^x$

$y = 12\left(\frac{1}{4}\right)^x$




(0,12)
(1,3)