Name:
Date:

Graphs and LOGs

Part I: LOGs and Graphs

x	2^x
0	*0*
1	*2*
2	*4*
3	*8*
4	*16*
5	*32*
6	*64*
7	*128*

1. Fill out the table for the function $y = 2^x$

2. Using the table, graph the function $y = 2^x$ on graph paper. Be sure to put the x axis all the way at the bottom of the page and the y axis to the left of the page. What kind of shape do you get? What do you call this function?

When we graph these points, we see points that connect in an exponential shape. This is called an exponential function.

3. Using the same set of axis, for each point(x, y), graph the point$(x, \log_2 y)$. What kind of shape to do you get? What do you call this kind of function? What is the equation of this graph?

When we graph these points, we see points that connect in a linear shape. This is called a linear function. The equation of this graph is y=x.

(x, y)	$(x, \text{Log}_2\, y)$
0, 0	*0, 0*
1, 2	*1, 1*
2, 4	*2, 2*
3, 8	*3, 3*
4, 16	*4, 4*
5, 32	*5, 5*
6, 64	*6, 6*
7, 128	*7, 7*

4. Why would taking the Log_2 of the graph of $y = 2^x$ turn it into a ____*linear*____ function? Explain.

Taking the Log_2 of the graph of $y = 2^x$ turns it into a linear function because they are inverse functions.

5. Which property (or properties) of LOGs display this?

$[Argument] = [Base]^{[Exponent]}$ → $Log_{[Base]}[Argument] = [Exponent]$

<u>Part II</u>: LOGs and Scale

In learning about LOG properties we saw that multiplying two numbers corresponds to adding the LOGs of their arguments. For example:

$2 \cdot 8 = 16$

x	$\text{Log}_2 x$
1	0
2	**1**
4	2
8	**3**
16	**4**
32	5

$1 + 3 = 4$

6. Which property (or properties) of LOGs display this? Show another example.

When adding logs you can multiply their arguments:
LOG AB = LOG A + LOG B

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