Algebra 3-4 Name: _____ Per:_____
Unit 3 Day 3 Date: _____

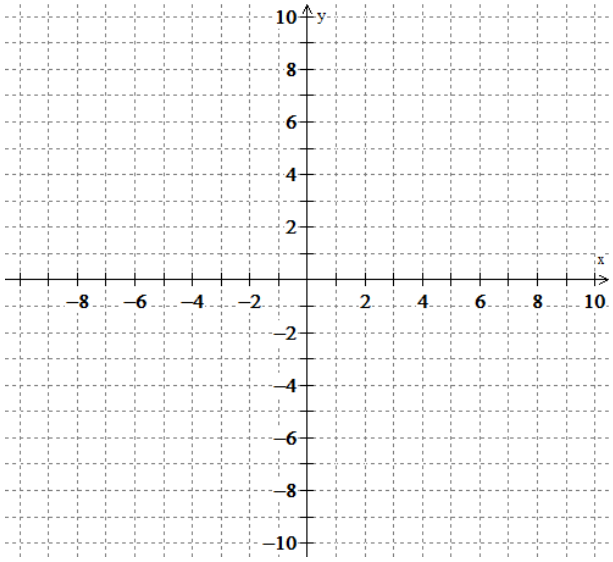
1) Carefully draw the graph of $y = 2^x$, complete the table and list its features.

2) Use your knowledge of inverses to graph the inverse in a different color.

$y = 2^x$

x-intercept:
y-intercept:
Domain:
Range:
Asymptotes:

x	y
-2	
-1	
0	
1	
2	
3	



inverse

x-intercept:
y-intercept:
Domain:
Range:
Asymptotes:

x	y

3) Why are all the y-values on the graph of $y = 2^x$ positive?

How does this impact the graph of the inverse $y = 2^x$?

4) For $y = 2^x$ find as many missing x-values as you can in the table below.

x														
y	8	32	½	1	16	4	3	64	2	0	¼	-1	128	39

a) Describe your thinking.

b) Which x-values are impossible to find? Why?

c) Which x-values are difficult to find? Why?

5) Using the following clues, find the missing pieces of the puzzles below. Explain how your answers make sense.

CLUES

$\log_2 8 = 3$ $\log_3 27 = 3$ $\log_5 25 = 2$ $\log_{10} 1000 = 4$

PUZZLES

a) $\log_3 16 = ?$ b) $\log_2 64 = ?$ c) $\log_3 100 = 2$

d) $\log_? 5 = 3$ e) $\log_3 81 = 4$ f) $\log_{100} 10 = ?$

6) Logarithms are the inverse functions of exponential functions. So, every exponential equation can be re-written in its logarithmic form and every logarithmic equation can be rewritten in its exponential form. For example,

Exponent ↓ exponent ↓

$4^3 = 64$ is equivalent to $3 = \log_4 64$

↑ Base ↑ base

We read the second equation as: "The log base 4 of 64 is 3."

Using this information complete this table:

Exponential form	Logarithmic Form
$y = 5^x$	
	$y = \log_7(x)$
$8^x = y$	
$A^k = C$	
	$K = \log_A(C)$
	$\text{Log}_{½}(K) = N$

7) Write the equation for the inverse of $y = 2^x$. _____