

Name _____

Date _____

Advanced Algebra

Unit 3: Exponential, Log and Power Functions

Inverse of Exponential...Log Functions

Assignment #13

Simplify the following using your Log rules. All answer should be exact answers

1) $\log_5 12 - \log_5 2$

$\log_5 \frac{12}{2}$ $\log_5 (6)$

2) $\log_5 16 + \log_5 4$

$\log_5 16 \cdot 4$ $\log_5 64$

3) $3 \log_{10} x + \log_{10} 7$

$\log_{10} x^3 + \log_{10} 7$
 $\log_{10} 7x^3$

4) $5 \log_4 5 - 5 \log_4 2$

$\log_4 \frac{5^5}{2^5}$ $\log_4 (2.5)^5$

5) $3 \log_3 46 - 3 \log_3 138$

$\log_3 \frac{46^3}{138^3}$ $\log_3 (\frac{1}{3})^3$ $\log_3 \frac{1}{27}$
-3

6) $\log_7 56 - 3 \log_7 2$

$\log_7 (\frac{56}{2^3})$ $\log_7 (\frac{56}{8})$ $\log_7 7$
1

7) $\log_{10} 12 + \log_{10} x + 3 \log_{10} y$

$\log_{10} 12xy^3$

8) $\log_{10} 405 - 4 \log_{10} \frac{1}{3}$

$\log_{10} \frac{405}{(\frac{1}{3})^4}$ $\log_{10} (\frac{405}{81})$ $\log_{10} 5$

9) $4 \log_8 2 + 4 \log_8 x + 2 \log_8 y$

$\log_8 2^4 + \log_8 x^4 + \log_8 y^2$
 $\log_8 16x^4y^2$

10) $\log_3 2 + \frac{1}{2} \log_3 y$

$\log_3 2 + \log_3 y^{\frac{1}{2}}$
 $\log_3 2\sqrt{y}$

11) $10 \log_{10} x + 2/3 \log_{10} 64$

$\log_{10} x^{10} + \log_{10} 64^{\frac{2}{3}}$
 $\log_{10} x^{10} + \log_{10} 16$ $\log_{10} 16x^{10}$

12) $2 \log_{10} 9 + 5 \log_{10} x + \log_{10} \frac{1}{3}$

$\log_{10} 9^2 + \log_{10} x^5 + \log_{10} \frac{1}{3}$
 $\log_{10} 81 \cdot x^5 \cdot \frac{1}{3}$ $\log_{10} 27x^5$

Assignment #13

Solve the following equations:

1) $\log_4 2 - \log_4 x = \log_4 \frac{2}{3}$

$$\log_4 \frac{2}{x} = \log_4 \frac{2}{3}$$

$$x = 3$$

2) $\log_3 6 = \log_3 3 + \log_3 x$

$$\log_3 6 = \log_3 3x$$

so $6 = 3x$

$$x = 2$$

3) $\log_4 5 = \log_4 10 - \log_4 x$

$$\log_4 5 = \log_4 \frac{10}{x}$$

so $x = 2$

4) $\log_3 3 = \log_3 x - \log_3 3$

$$\log_3 3 = \log_3 \frac{x}{3}$$

so $x = 9$

5) $\log_3 8 = x \log_3 2$

$$\log_3 8 = \log_3 2^x$$

$$x = 3$$

6) $\log_{10} 16 = x \log_{10} 2$

$$\log_{10} 16 = \log_{10} 2^x$$

$$x = 4$$

7) $\log_2 x = \frac{1}{2} \log_2 4$

$$\log_2 x = \log_2 4^{\frac{1}{2}}$$

$$x = 2$$

8) $\frac{1}{3} \log_4 x = \log_4 4$

$$\log_4 x^{\frac{1}{3}} = \log_4 4$$

so $x^{\frac{1}{3}} = 4$

$$x = 64$$

Graphing Assignment: Carefully graph and see how they are related .

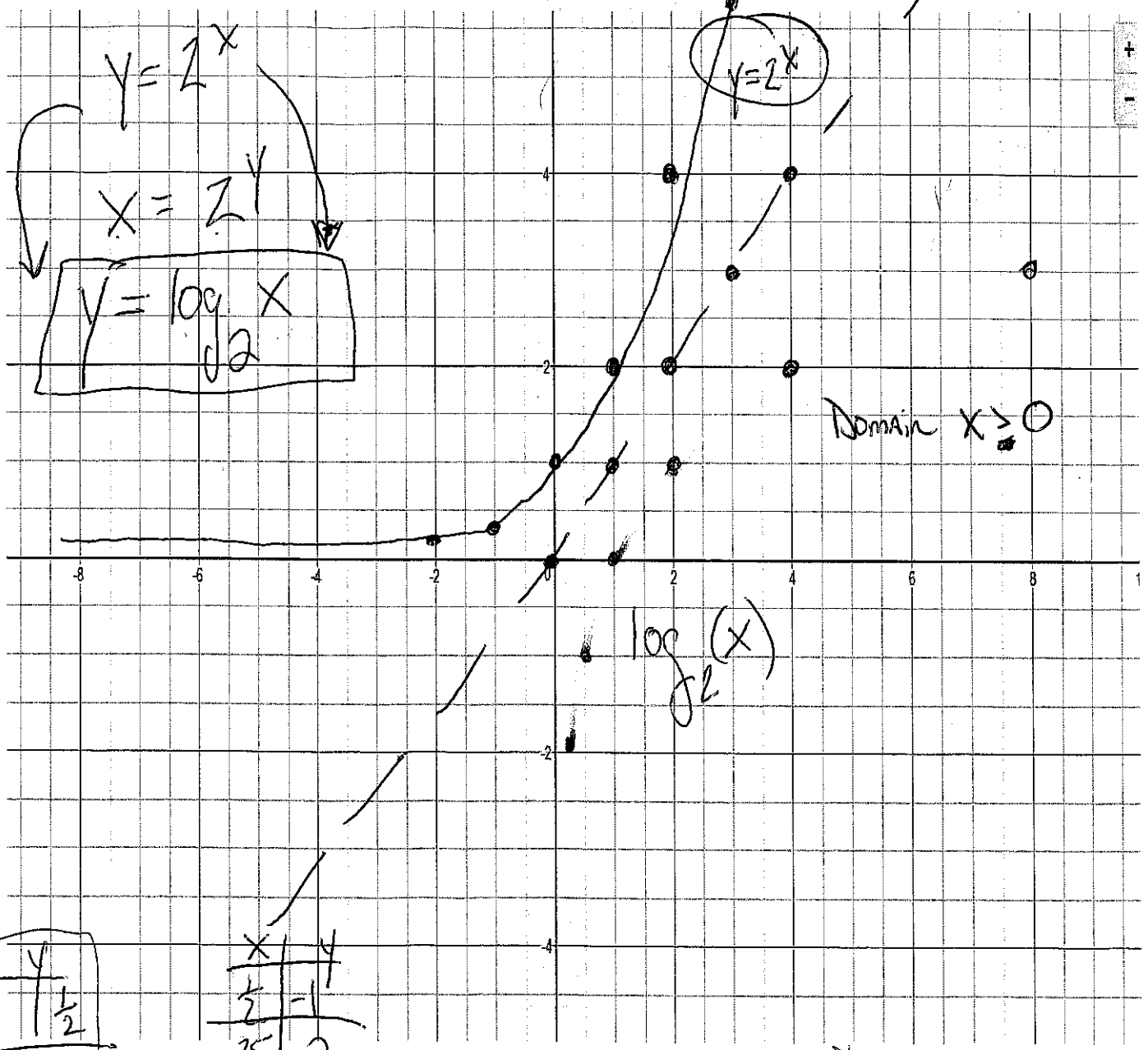
Question: How are the exponential graph and the Log graph related? You will be comparing $y=2^x$ and $y=\log_2 x$

Step 1: Graph $y=2^x$

Step 2: Find the Inverse of $y=2^x$

Step 3: Enter those in your calculator. Show both tables below and make graphs of each.

$y=x$



X	y
-1	$1/2$
-2	0.25
0	1
1	2
2	4
3	8

x	y
$1/2$	-1
0.25	-2
1	0
2	1
4	2
8	3

~~$10^3 = 3$~~