

Name _____

Date _____

Advanced Algebra

Unit 3: Exponential, Log and Power Functions

Inverse of Exponential...Log Functions

Assignment #11

Re-Write the equations in exponential form

| | | | |
|----------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1) $\log_3 27 = 3$ $3^3 = 27$ | 2) $\log_4 256 = 4$ $4^4 = 256$ | 3) $\log_6 36 = 2$ $6^2 = 36$ | 4) $\log_6 216 = 3$ $6^3 = 216$ |
| 5) $\log_2 32 = 5$ $2^5 = 32$ | 6) $\log_8 64 = 2$ $8^2 = 64$ | 7) $\log_5 125 = 3$ $5^3 = 125$ | 8) $\log_1 1 = 3$ $1^3 = 1$ |

Re-Write each equation in logarithmic form

| | | | |
|------------------------------------|---|---|---|
| 9) $3^5 = 243$ $\log_3 243 = 5$ | 10) $10^{.12} = 1.318$ $\log_{10} 1.318 = .12$ | 11) $4^{-1} = \frac{1}{4}$ $\log_4 \frac{1}{4} = -1$ | 12) $16^{-1/2} = \frac{1}{4}$ $\log_{16} \frac{1}{4} = -\frac{1}{2}$ |
| 13) $4^3 = 64$ $\log_4 64 = 3$ | 14) $13^2 = 169$ $\log_{13} 169 = 2$ | 15) $9^{2/3} = 4.327$ $\log_9 4.327 = \frac{2}{3}$ | 16) $6^4 = 1296$ $\log_6 1296 = 4$ |

Assignment #11

Evaluate each. (You should be able to do these without the calculator)

| | | | | |
|--|--|---|---|--|
| 17) $\log_5 25$ 2 | 18) $\log_9 9^{-.56}$ -.56 | 19) $\log_{12} 1$ 0 | 20) $\log_9 81$ 2 | 21) $\log_4 4^{5/6}$ 5/6 |
| 22) $\log_4 2$ 1/2 | 23) $\log_{1/2} 1/2$ 1 | 24) $\log_5 (-25)$ not possible | 25) $\log_2 1/8$ -3 | |

5^{\square} is never negative

Solve the following equations for x. You might want to re-write them into exponential form if you are unsure of what it is asking. Remember the relationship. $\log_{\text{base}} \text{answer} = \text{exponent}$ so you should be able to flip that to $\text{base}^{\text{exponent}} = \text{answer}$

1) $\log_3 81 = x$

4

2) $\log_2 256 = x$

8

3) $\log_6 x = -1$

1/6

4) $\log_x 343 = 3$

$x^3 = 343$

5) $\log_x 343 = 3$

$x^3 = 343$

6) $\log_3 x = 5$

$3^5 = x$
243

$3^5 = 243$

7) $\log_4 x = 2$

$4^2 = x$
16

8) $\log_x 64 = 3$

$x^3 = 64$

9) $\log_x 243 = 5$

$x^5 = 243$

10) $\log_x 256 = 8$

$x^8 = 256$

11) $\log_5 x = 1$

$5^1 = x$
5

12) $\log_2(x+1) = 1$

$2^1 = x+1$
1 = x

13) $\log_5(x-4) = 0$

$5^0 = (x-4)$
 $1 = x-4$
 $x = 5$