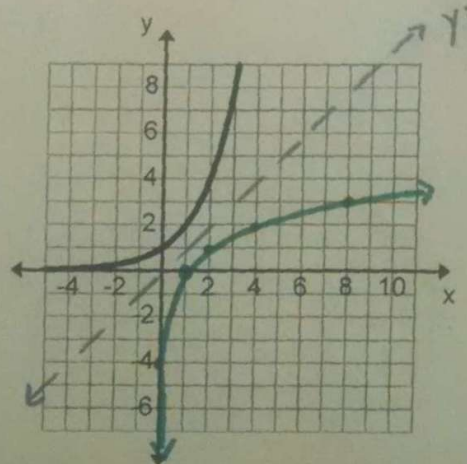
$\log(x) = \log_{10}(x)$

Write each logarithmic equation in exponential form.

1. $\log_7 49 = 2$ $7^2 = 49$	2. $\log_8 0.125 = -1$ $8^{-1} = .125$	3. $3 = \log_5 125$ $5^3 = 125$	4. $x = \log_6 \frac{1}{216}$ $6^x = \frac{1}{216}$
5. $\log_8 64 = x$ $8^x = 64$	6. $\log_7 x = 2$ $7^2 = x$	7. $\log_x 9 = 2$ $x^2 = 9$	8. $\log_7 4 = x$ $7^x = 4$ $x = .172\ldots$
9. $\log_{\frac{1}{2}} 256 = x$ $\left(\frac{1}{2}\right)^x = 256$ $x = -8$	10. $\log_{10} x = 3$ $10^3 = x$	11. $\log_p m = z$ $p^z = m$	12. $\log_e l = v$ $e^v = l$

Exponential Functions

$$b^x = a$$

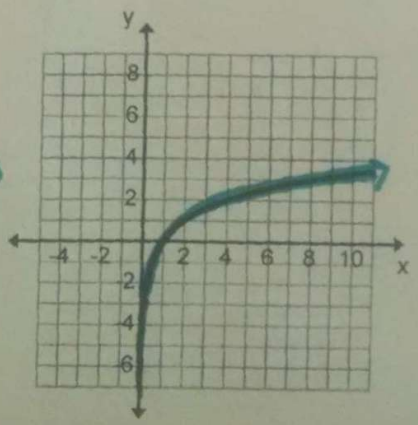


Inverse Functions

Logarithmic Functions

log base "b" of "a" equals "x"

$$\log_b a = x$$



Solve each exponential equation.

1. $2^{3x} = 4$

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

2. $3 = 9^{2x}$

$x = \frac{1}{4}$

3. $25 = 125^{x}$

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

4. $36^{2} = 6^{x}$

$x = 4$

5. $2^{-x} = 8$

$x = -3$

6. $81^{3-2x} = 27$

$x = \frac{9}{8}$

7. $9^{2n-2} = 27^{n}$

$n = 4$

8. $216^{x} = 36^{-3x-1}$

$x = -2/9$

9. $64^{2x-5} = 32$

$x = 35/12$

10. $27^{3x} = 9^{x-1}$

$x = -2/7$

11. $4^{x} = 16^{3}$

$x = 6$

$b^{x} = a$ $\quad\quad$ $\log_b(a) = x$

Write each exponential equation in logarithmic form.

1. $b\,2^{6} = 64\,a$

$\log_2(64) = 6$

2. $a\,1 = 5^{0}\,b$

$\log_5(1) = 0$

3. $b\,5^{-2} = 0.04\,a$

$\log_5(.04) = -2$

4. $3^{x} = 81$

$\log_3(81) = x$

5. $x^{6} = 5$

$\log_x(5) = 6$

6. $3^{3} = 81$

$\log_3(81) = 3$

7. $10^{2} = x$

$\log_{10}(x) = 2$

8. $2^{x} = 64$

$\log_2(64) = x$

9. $e^{5} = x$

$\log_e(x) = 5$

10. $p = h^{6}$

$\log_h(p) = 6$

11. $1^{6} = x$

$\log_1(x) = 6$

12. $5 = a^{6}$

$\log_a(5) = 6$

Alpha -> Window -> 5

Logarithms would be easier if I knew...

$4 = 2^{2}$

$8 = 2^{3}$

$16 = 2^{4}$

$32 = 2^{5}$

$64 = 2^{6}$

$36 = 6^{2}$

$216 = 6^{3}$

$9 = 3^{2}$

$27 = 3^{3}$

$81 = 3^{4}$

$243 = 3^{5}$

$25 = 5^{2}$

$125 = 5^{3}$

$625 = 5^{4}$

Bases must be the Same!

Solve for x:

1) $5^{x-1} = 25^2$

$5^{(x-1)} = (5^2)^2$

$x - 1 = 2 \cdot 2$

$x - 1 = 4$

$\boxed{x = 5}$

2) $27 = 3^{2x+1}$

$3^3 = 3^{2x+1}$

$3 = 2x + 1$

$2 = 2x$

$\boxed{x = 1}$

3) $16^x = 32$

$(2^4)^x = 2^5$

$4 \cdot x = 5$

$\boxed{x = 5/4}$

4) $8^{x+1} = 4$

$(2^3)^{x+1} = 2^2$

$3(x+1) = 2$

$3x + 3 = 2$

$3x = -1$

$\boxed{x = -\frac{1}{3}}$

5) $216 = 6^{3x-1}$

$6^3 = 6^{3x-1}$

$3 = 3x - 1$

$4 = 3x$

$\boxed{x = 4/3}$

GLUE