

Lesson 56- Logs.notebook

January 22, 2018

Lesson 56 Objective: SWBAT find the inverse of exponential functions.

Kickoff- Solve, graph and write interval notation.

$$1 + \frac{2}{x+1} = \frac{2}{x}$$

$$\frac{x(x+1)}{x+1} = \frac{2}{x}$$

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

$$x^2 + 3x = 2x + 2$$

$$x^2 + 3x - 2x - 2 = 0$$

$$x^2 + x - 2 = 0$$

$$(x+2)(x-1) = 0$$

$$x = -2, x = 1$$

C.P.

$x = -1$

$x = 0$

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

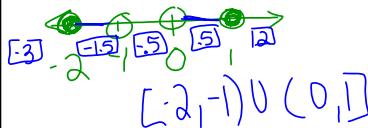
$$x^2 + 3x = 2x + 2$$

$$x^2 + 3x - 2x - 2 = 0$$

$$x^2 + x - 2 = 0$$

$$(x+2)(x-1) = 0$$

$$x = -2, x = 1$$



Logs

Try this: Find the inverse of $f(x) = x + 4$

$$-x = y + 4$$

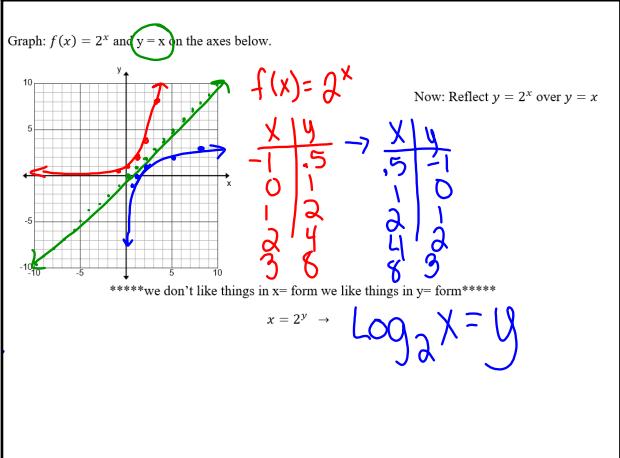
$$-x - 4 = y$$

$$f^{-1}(x) = x - 4$$

Remember: The inverse is a reflection of the line $y = x$

Rule: $(x, y) \rightarrow (y, x)$

Rule: Switch x and y!



Rule: Log always = Exponent.

Base^{Exponent} = Answer →

Log Answer = Exponent

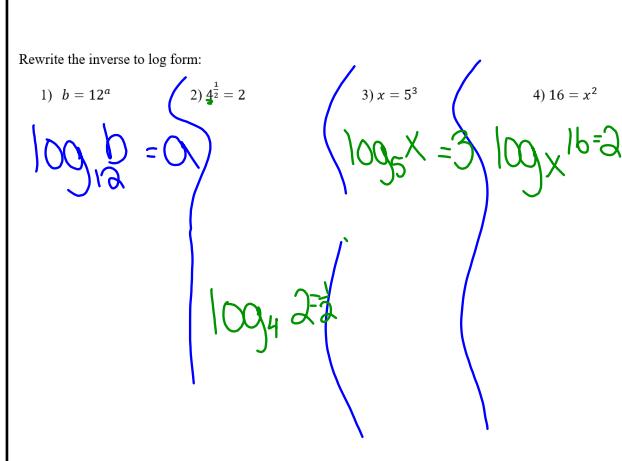
What is the inverse of $y = e^{x?}$

Ln (natural log)

Therefore: $x = e^y \rightarrow$

$$\log_e x = y$$

$$\ln x = y$$



Rewrite the log in exponential form:

$$5) \log_2 32 = 5 \quad 6) \log_3 27 = 3 \quad 7) \log_{10} \frac{1}{100} = -2 \quad 8) \log_3 1 = 0$$

$$2^5 = 32$$

$$3^3 = 27$$

$$10^{-2} = \frac{1}{100}$$

$$3^0 = 1$$

Solve for the variable:

Rewrite in exponential form

9) $\log_7 x = 0$

$7^0 = x$

$1 = x$

11) $\log_8 32 = x$

$8^x = 32$

$(2^3)^x = 2^5$

$3x = 5$
 $x = \frac{5}{3}$

10) $\log_{81} x = \frac{1}{2}$

$81^{\frac{1}{2}} = x$

12) $\log_x 125 = 3$

$x^3 = 125$

$x^3 = 5^3$

$x = 5$