Graphing an exponential function and its asymptote: f(x) = a(e)$^{x-b}$ + c

Graph the following function.

$$g(x) = \frac{1}{4}e^{x-3} - 4$$

To draw the graph, plot two points and the asymptotes (if any) of the graph. Then click on the graph icon.

$g(0) = \frac{e^{-3}}{4} - 4 = \frac{1}{4e^3} - 4$

$g(3) = \frac{1}{4} - 4 = -3.75$

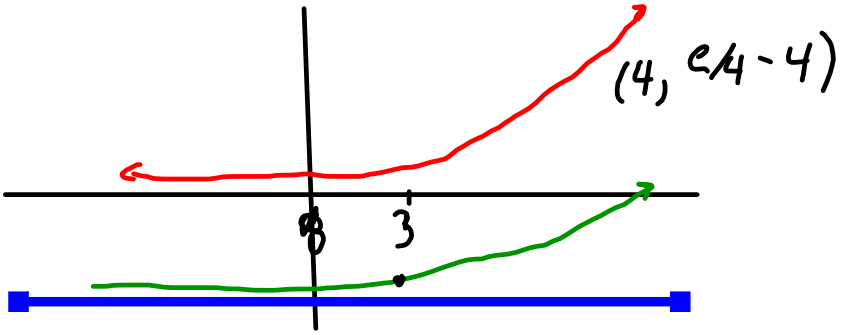
$g(4) = \frac{e}{4} - 4$ (3, -3.75

parent: e^x

-3 right 3

.25 shrink

-4 lower 4



Evaluating an exponential function that models a real-world situation

A species of animal is discovered on an island. Suppose that the population size $P(t)$ of the species can be modeled by the following exponential function, where time t is measured in years.

$$P(t) = \frac{550}{1 + 6e^{-0.31t}}$$

Find the initial population size of the species and the population size after 8 years. Round your answers to the nearest whole number as necessary.

intial t = 0 P(0)= 550/(1+6e^(0))

at 8 years t = 8 P(8)=550/(1+6e^(-.31*8)=

Precalc= study of functions

function= job

domain = in

range = outbox

vertical line test for functions

inverse function = undoes a function

Inverse Function
Switch Domain + Range

$f^{-1}(x) = \frac{1}{2}x$ $\quad f(x) = 2x$

$f^{-1}(6) = 3$ $\quad f(3) = 6$

$g(x) = x^2 \quad (x \geq 0)$

x	g(x)
3	9
-3	9

FAILS Horizontal Line Test

$g(3) = 9$

$g(-3) = 9$

PASS VLT

x	$g^{-1}(x)$
9	3
9	-3

$g^{-1}(x) = \sqrt{x}$

FAILS Vertical Line Test

How to Find

1. Solve for X
2. $x \to y^{-1}$, $y \to x$ (switch x & y)

STEP 1

$y = \frac{2x-4}{x}$

$xy = 2x-4$

$xy-2x=-4$

$x(y-2)=-4$

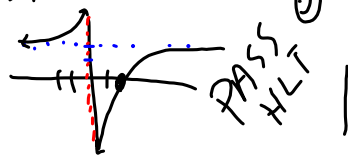
$x = \frac{-4}{y-2}$

STEP 2

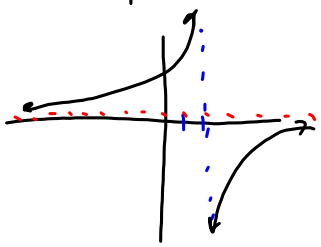
$y^{-1} = \frac{-4}{x-2}$

$y = \frac{2x-4}{x}$

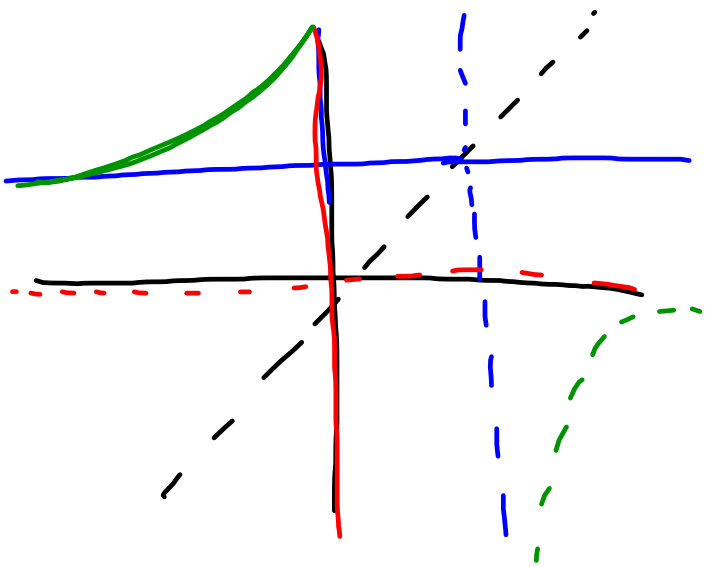
Does it??? PASS HLT? ☺



HAS A INVERSE!

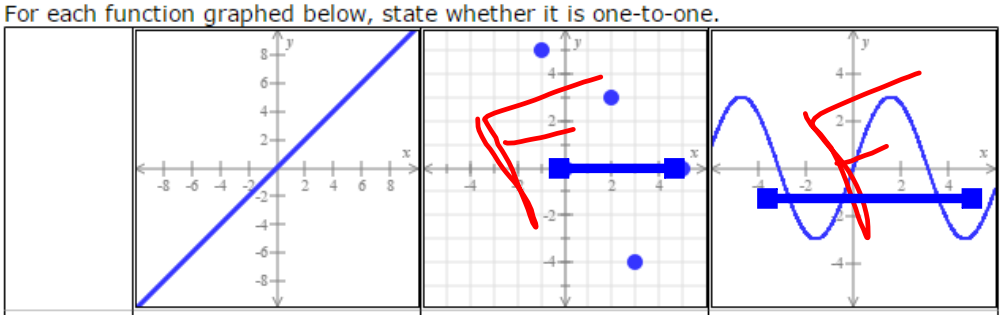


$y^{-1}(3) = -4$



Day 10 - Question #1;
Horizontal line test

For each function graphed below, state whether it is one-to-one.



One-to-one?	Yes No	Yes No	Yes No
One-to-one?	Yes No	Yes No	Yes No

Composite Functions f(g(x))

put g inside of f

$f(x) = x+1$

$g(x) = x^2$

$g(f(x)) = g(x+1) = (x+1)^2$

$f(g(x)) = f(x^2) = x^2+1$

$f(g(2)) = f(4) = 5$

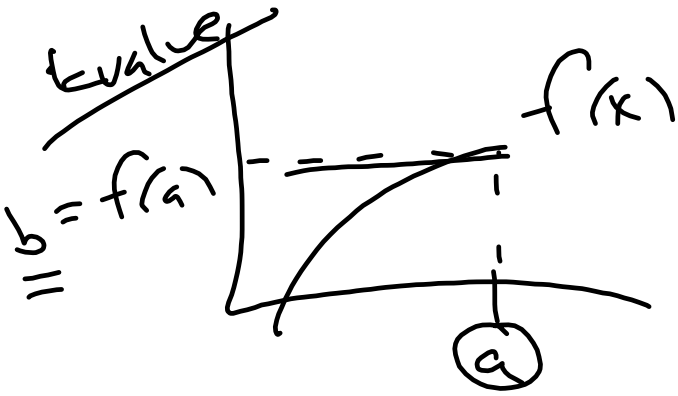
Define $(f \circ g)(x) \equiv f(g(x))$

Inverse $(f \circ f^{-1})(x) = x$

$(f^{-1} \circ f)(x) = x$

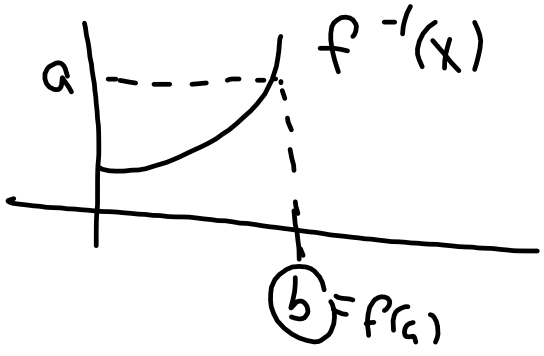
Ex $h(h^{-1}(7)) = 7$

Ex $p^{-1}(p(6)) = 6$



$b = f(a)$

$f^{-1}(b) = a$



Evelve the Inverse inverse To solve

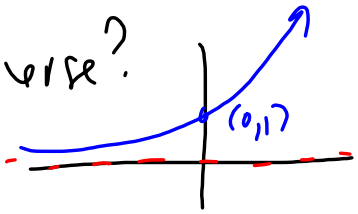
Example ???

$$y = 3^x$$

Does it have an inverse?

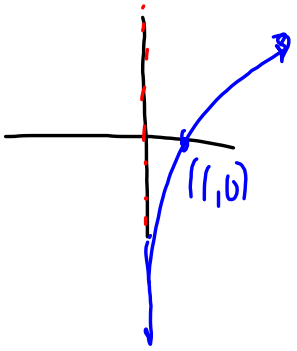
Exponential

Pass HLT. yes



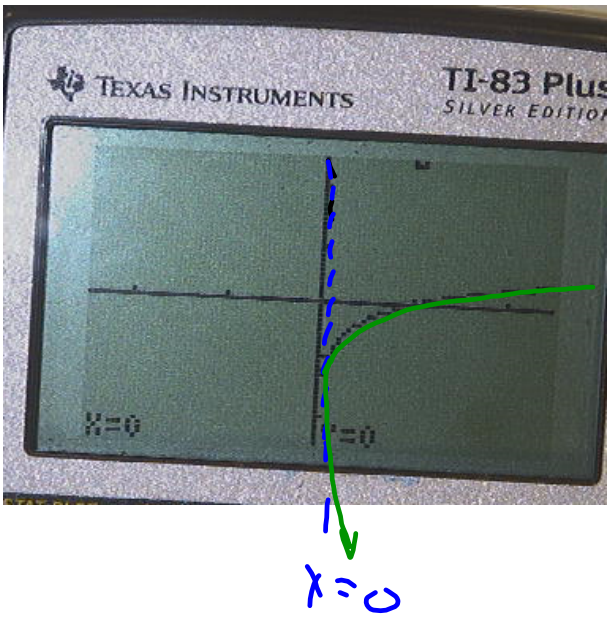
1. $x = \log_b y$

2. $y^{-1} = \log_3 x$.



~~Ex~~ $y = 10^x$

$y^{-1} = \log_{10} x \equiv \log x$ (common)



$y = 10^x$

D: $\mathbb{R}$

R: $(0, \infty)$

$y = \log x$

D: $(0, \infty)$

R: $\mathbb{R}$

Natural log

$y = e^x$

$y^{-1} = \ln x$ D: $(0, \infty)$

Do a LN regression... make a prediction

put in words!!!!

To graph $\log_B X$

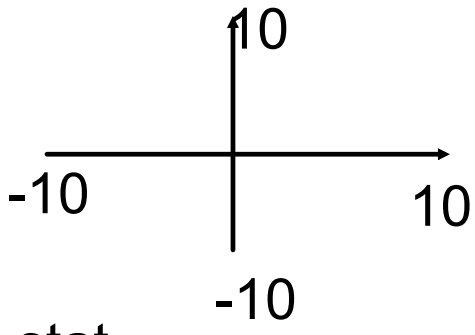
$Y_1 = \log(X)/\log(B)$

Ex $y = 1/2 \log_{20}(3x) + 7$

$Y_1 = (1/2)\log(3x)/\log(20) + 7$

Adjusting the Window on TI83 calculator

For ALEKS homework...try Zoom 6: standard



For DATA try ZOOM 9: stat

If you want to see a shole graph for give x values...try ZOOM 0: zoomfit