10.08 Intro to Graphing Logarithmic Functions

Date: _____

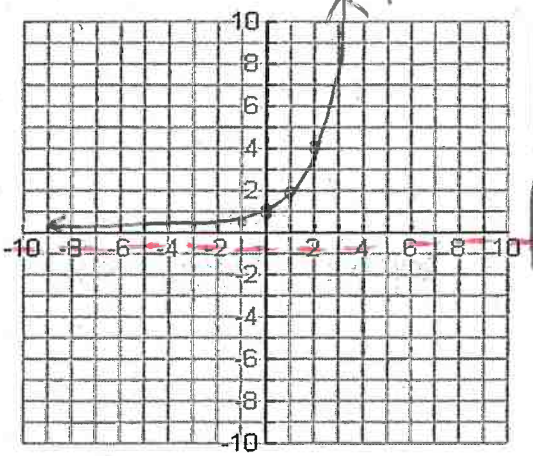
Find Inverse:
1) swap x and y
2) solve for y

Graph $f(x) = 2^x$

$2^{-1} = \frac{1}{2}$ | $2^1 = 2$
$2^0 = 1$ | $2^2 = 4$

$y = 2^x$
$x = 2^y$

x	y
-1	1/2
0	1
1	2
2	4



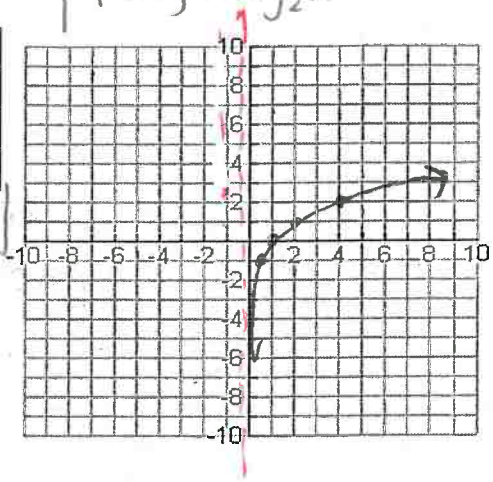
Domain: $(-\infty, \infty)$ Range: $(0, \infty)$

Asymptote: $y = 0$ x-intercept: none

Find the inverse of $f(x) = 2^x$ then graph it

$2^y = x$
$\log_2 2^y = \log_2 x$
$y \log_2 2 = \log_2 x$
$f(x) = \log_2 x$

x	y
1/2	-1
1	0
2	1
4	2



Domain: $(0, \infty)$ Range: $(-\infty, \infty)$

Asymptote: $x = 0$ x-intercept: $(1, 0)$

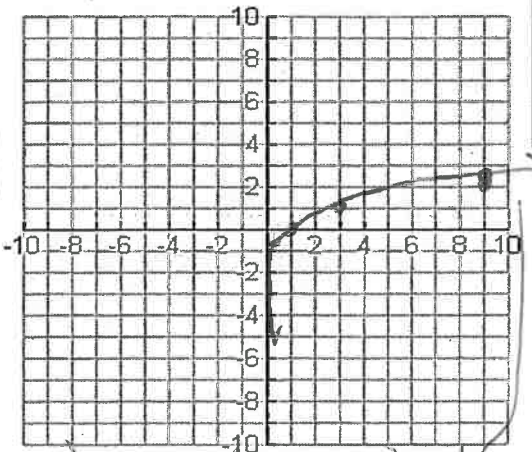
What do you notice about the two graphs? Ordered pairs are switched b/t function and inverse

Graph $f(x) = \log_3 x$

$y = \log_3 x$
$3^y = x$

x	y
$1/\sqrt{3}$	-1/2
1	0
3	1
9	2

$3^{-1/2} = \frac{1}{\sqrt{3}}$



x	y
1	0
3	1
3^2	2
3^3	3

Domain: $(0, \infty)$ Range: $(-\infty, \infty)$

Asymptote: $x = 0$ x-intercept: $(1, 0)$

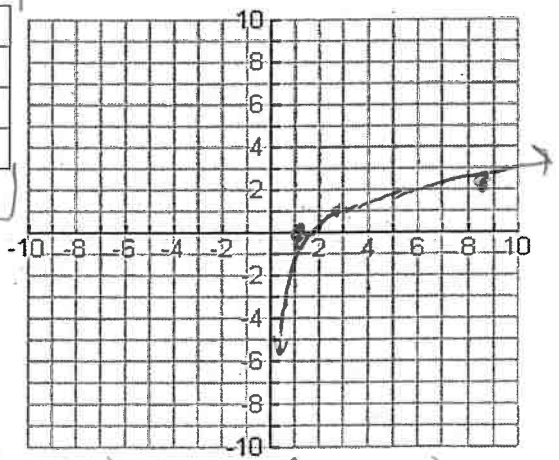
$f(x) = \ln x$

$y = \log_e x$
$e^y = x$

x	y
$1/\sqrt{e}$	-1/2
1	0
e	1
e^2	2

$e^{-1/2} = \frac{1}{\sqrt{e}}$

$e \approx 2.7$



x	y
e	1
e^2	2
e^3	3
1	0

Domain: $(0, \infty)$ Range: $(-\infty, \infty)$

Asymptote: $x = 0$ x-intercept: $(1, 0)$