Graphing Logs

* remember logs & exp are inverses (this helps w/ key points)

parent functions

ex $y = 4^x$

key pts:

x	y
-1	1/4
0	1
1	4

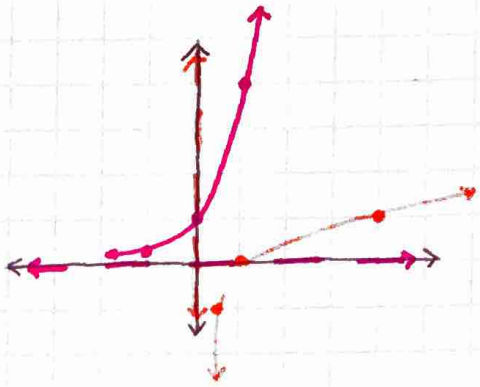
asymptote: $y = 0$

→ (the inverse) $y = \log_4 x$

key pts:

x	y
1/4	-1
1	0
4	1

asymptote: $x = 0$



$$y = a \log_{base}\left(\frac{x-h}{b}\right) + k$$

$a \rightarrow$ VD
base → key pts
$b \rightarrow$ HD *
$h \rightarrow$ L/R *
$k \rightarrow$ U/D

eq → graph

ex $y = 4 \log_3 (x-1) + 2$

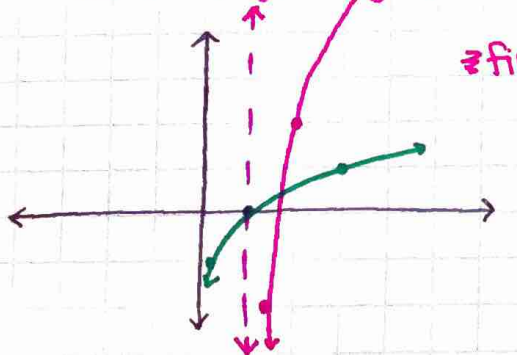
1. PF & inverse PF
   $y = \log_3 x$ & $y = 3^x$
2. key pts of inverse PF

$y = 3^x$	x	-1	0	1
	y	1/3	1	3

3. key pts of PF

x	1/3	1	3
y	-1	0	1

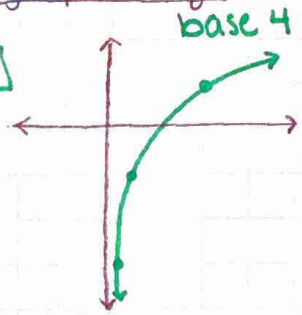
4. list transformations
   VD by 4, R1, U2
5. graph PF & final
   * don't forget asymptote



= final

graph → eq

ex



1. PF
   $y = \log_4 x$
2. * L/R (look at the asymptote, should be at $x = 0$)
   none
3. U/D (look at middle pt, should be on the x-axis)
   down 1
4. vertical dilation (look at vertical spaces btwn pts, should be 1)
   VD by 2
5. * horizontal dilation (look at spaces btwn the middle pt & asymptote)
   $\frac{1}{2}$
6. write eq.
   $y = 2 \log_4 (2x) - 1$