

Precalc 11.4

Evaluate expressions involving logarithms

Solve equations and inequalities involving logarithms

Graph logarithmic functions and inequalities

$=$

$\leq \geq$

inverse function

logarithm

logarithmic function

base

Logarithmic Function

The logarithmic function $y = \log_a x$, where $a > 0$ and $a \neq 1$, is the inverse of the exponential function $y = a^x$. So, $y = \log_a x$ if and only if $x = a^y$.

exponent = $\log_{(\text{base})}$ number

Example: $2 = \log_{10} 100$

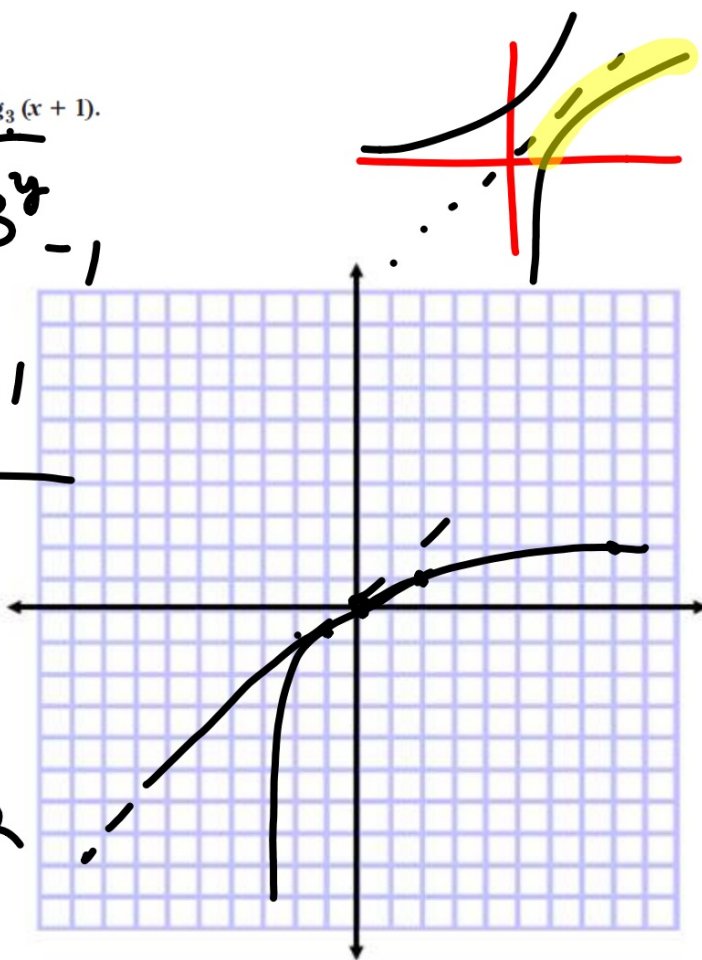
$$10^2 = 100$$

6 Graph $y = \log_3(x + 1)$.

$$x + 1 = 3^y$$

$$x = 3^y - 1$$

x	y
0	0
2	1
8	2
26	3
80	4



$x =$

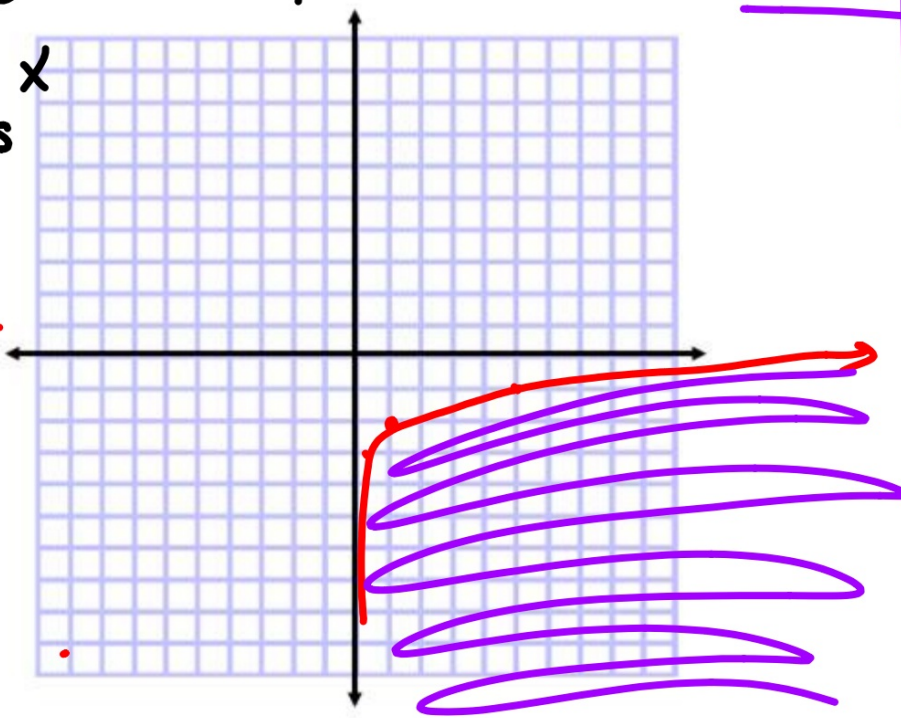
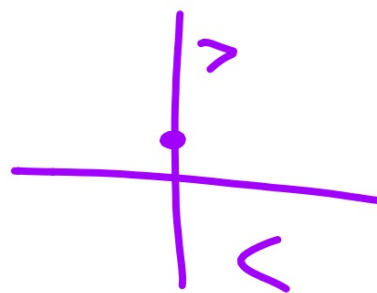
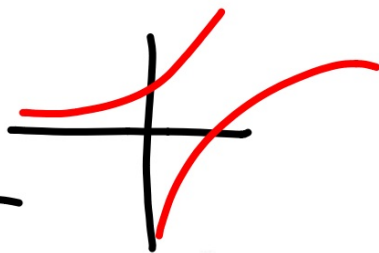
1. Write in exp form
2. Table of values
(choose y) ...why?
3. Symmetry
 $y = x$

7 Graph $y \leq \log_5 x - 2$

$$y = \log_5 x - 2$$

$$(y+2) = \log_5 x$$

x	y
25	0
125	1
5	-1
1	-2
$\frac{1}{5}$	-3

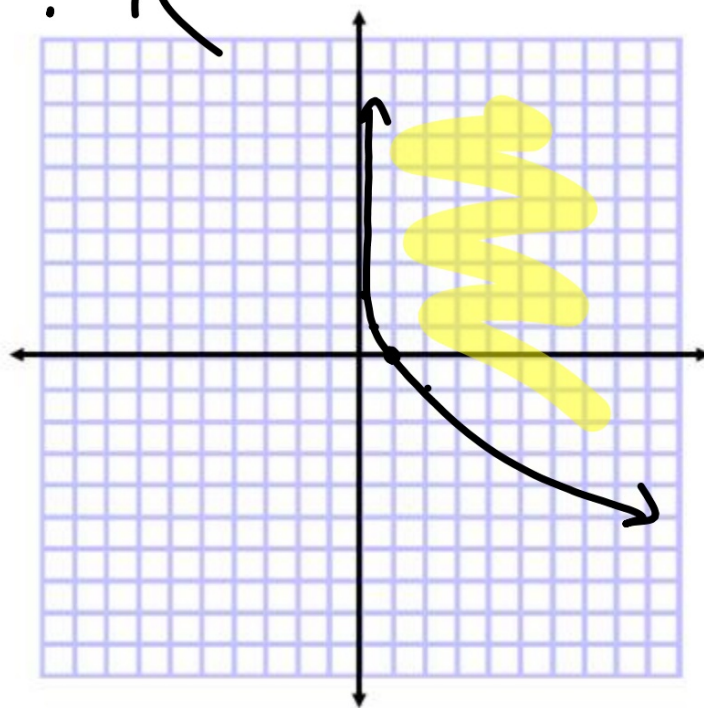
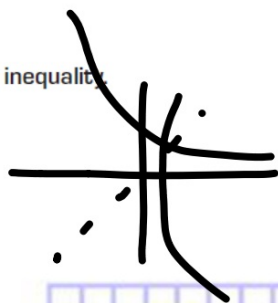


Graph each equation or inequality.

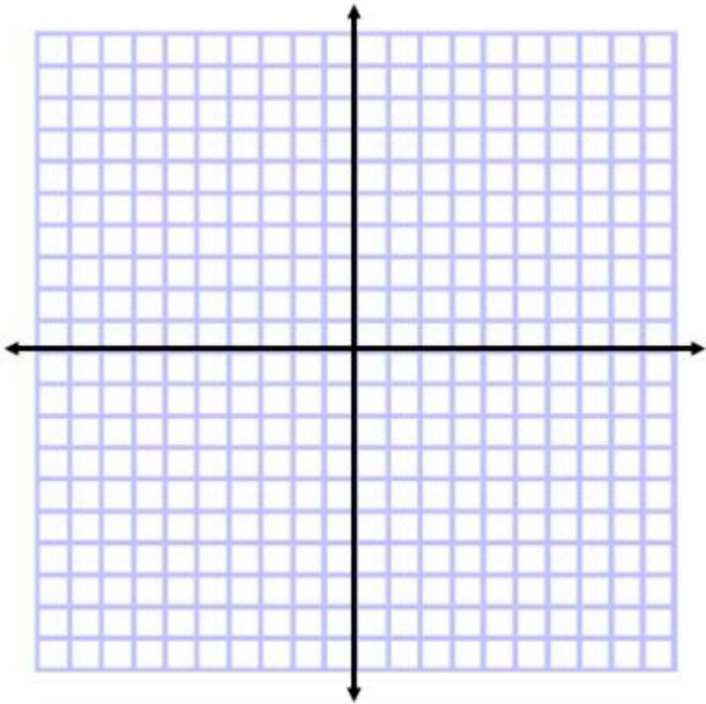
17. $y > \log_2 x$

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

x	y
1	0
$\frac{1}{2}$	1
$\frac{1}{4}$	2
2	-1

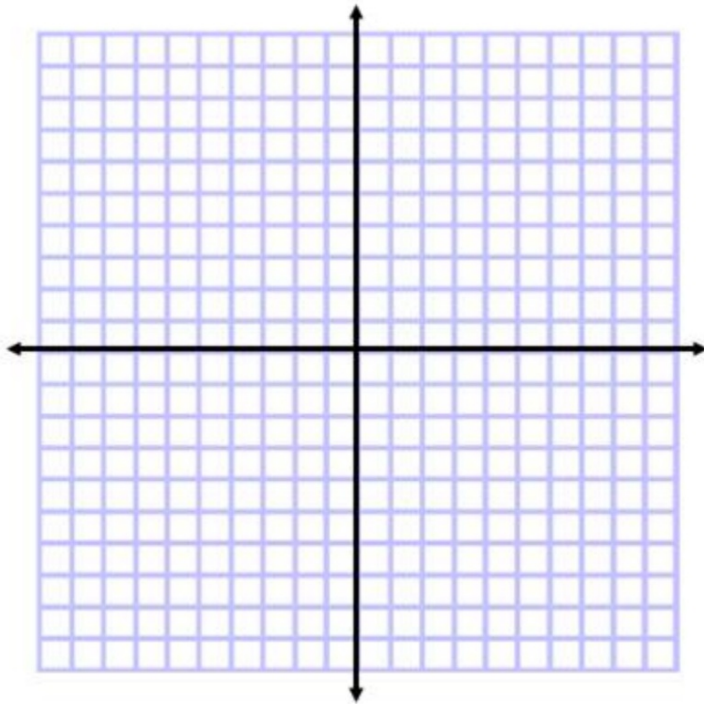


18. $y \geq \log_6 x$



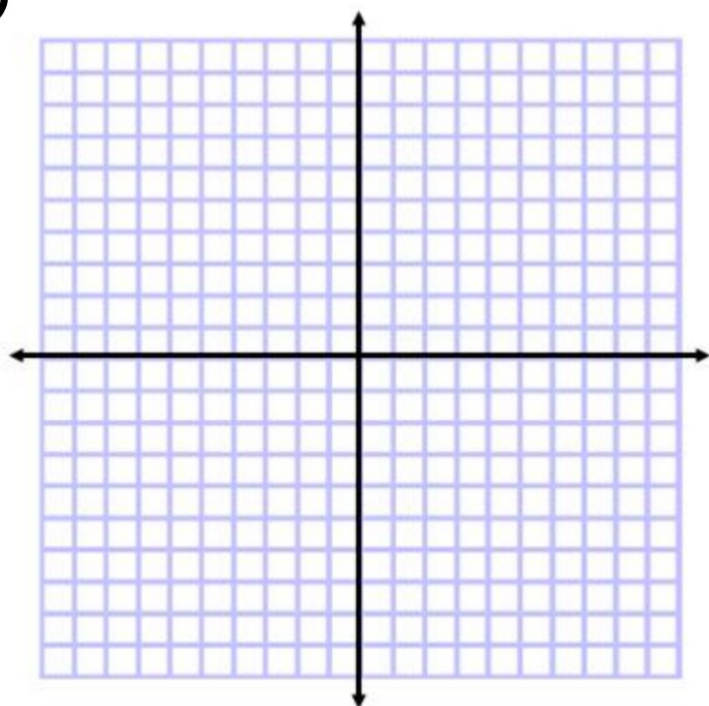
55. $y = \log_5(x - 1)$

$$x - 1 = 5^y$$



58. $y > \log_{10}(x + 1)$

$x + 1 = 10^y$



1.

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