MATH 1010 ~ Intermediate Algebra

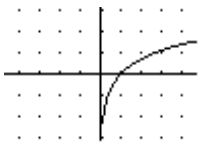
Chapter 9: EXPONENTIAL AND LOGARITHMIC FUNCTIONS

Section 9.3: Logarithmic Functions

Objectives:

- Evaluate logarithmic functions.
- Graph logarithmic functions.

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



$f(x)=\ln(x)$

Logarithmic Equations

$$y = \log_a x \Leftrightarrow x = a^y$$

Log Properties

$\log_a 1 =$

$\log_a a =$

$\log_a a^x =$

① EXAMPLE

Evaluate these expressions.

$a)\quad \log_6 1$ $b)\quad \log_{10}\left(\frac{1}{100}\right)$

$c)\quad \log_4(-1)$ $d)\quad \log_5(0)$

$e)\quad \log_{144} 12$ $f)\quad \log_2(256)$

② EXAMPLE

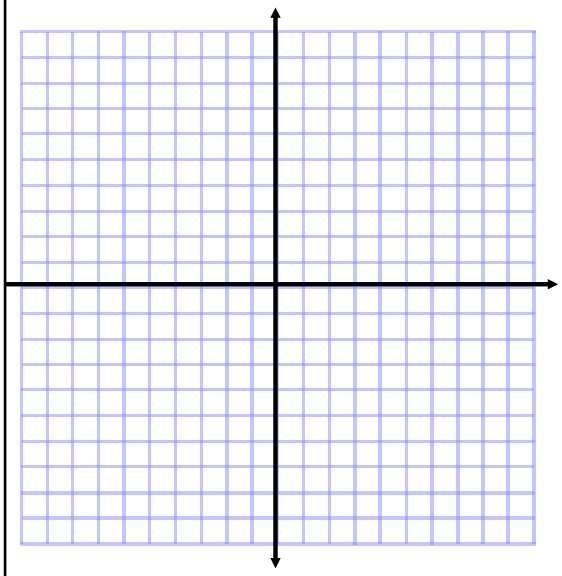
Rewrite in the other format.

$a)\quad \log_{32} 4 = \frac{2}{5}$ $b)\quad \log_3 \frac{1}{27} = -3$

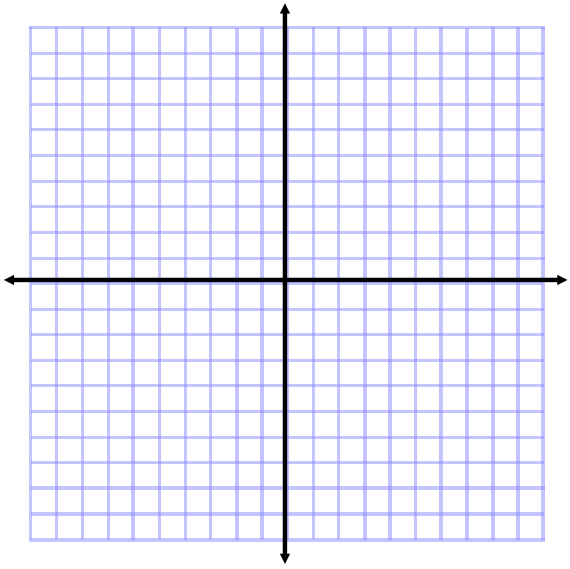
$c)\quad 6^{-3} = \frac{1}{216}$ $d)\quad 4^1 = 4$

Graphs and Vertical Asymptotes

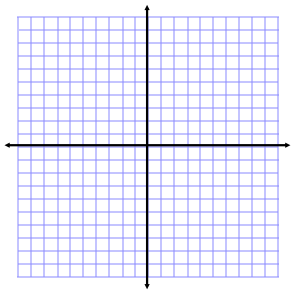
$y = 4^x$

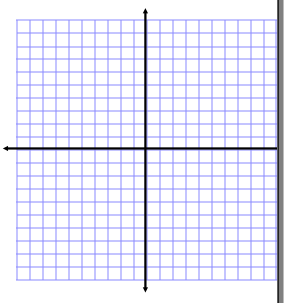


$y = \log_4 x$



a) $y = \log_3(x+2)$ *b)* $y = \log_3(-x)+5$





c) $y = \log_3(-x)-2$