Logs to Exponential, Evaluating Logs, and Graphing Logs

Definition:

Logarithm – let b and y be positive numbers with $b \neq 1$. The logarithm of y with base b is denoted by $log_b y$ and is defined as follows:

$log_b y = x$ if and only if $b^x = y$

(_____ form) (_____ form)

The expression $log_b y$ is read as "log base b of y"

*When there is no base, the base is _____

Example 1.) Rewrite the logarithmic equations in exponential form.

a.) $log_2 8 = 3$ b.) $log_4 1 = 0$ c.) $log_{12} 12 = 1$ d.) $log_{\frac{1}{4}} 4 = -1$

Example 2.) Evaluate the logarithm.

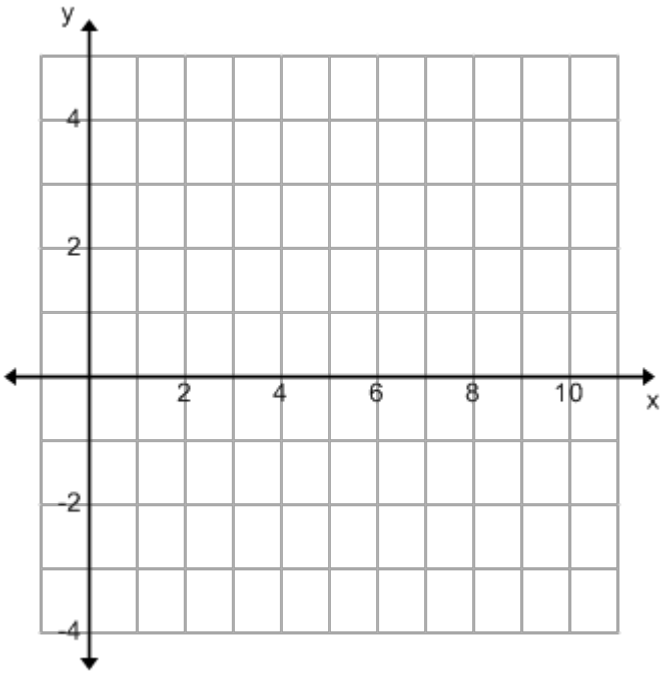
a.) $log_4 64$ b.) $log_5 0.2$ c.) $log_{\frac{1}{5}} 125$ d.) $log_{36} 6$

Definition:

Graphing Logarithmic Functions – You can use the _____ relationship between exponential and logarithmic functions to graph logarithmic functions.

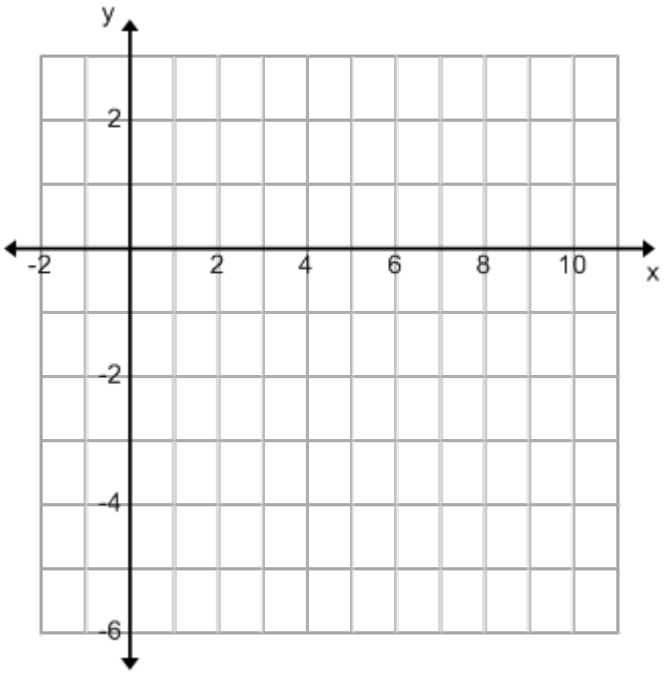
Example 6.) Graph the function, state the domain, state the range, and state the asymptote.

a.) $y = log_3 x$



D: _____ R: _____ A: _____

b.) $y = log_{\frac{1}{2}} x$



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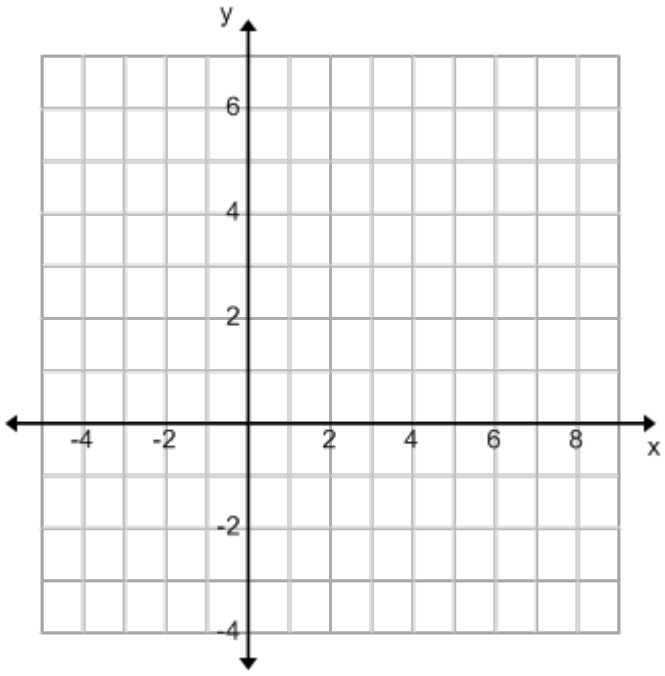
Definition:

Translations of Logarithmic Graphs – You can graph a logarithmic function of the form $y = log_b(x - h) + k$ by translating the graph of the _____ function $y = log_b x$.

Example 7.) Graph $y = log_2(x + 3) + 1$. State the domain, the range, and the asymptote.



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