

Logarithms

$$\log_b y = x \text{ if and only if } b^x = y$$

1. Rewrite the following into

Logarithmic Form:

Exponential Form:

A. $\log_2 8 = 3$

A.

B.

B. $4^0 = 1$

C. $\log_{12} 12 = 1$

C.

D.

D. $\left(\frac{1}{4}\right)^{-1} = 4$

Log Properties:

2. Evaluate:

a. $\log_4 64$

b. $\log_5 0.2$

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c. $\log_{1/5} 125$

d. $\log_{36} 6$

Common Log:

Natural Log:

3. Using a calculator find:

a. $\log 12$

b. $\ln 3$

Inverse Functions:

Logarithms are inverses of exponential functions

$$f(x) = b^x \text{ inverse of } g(x) = \log_b x$$

$$g(f(x)) =$$


$$f(g(x)) =$$

4. Simplify:

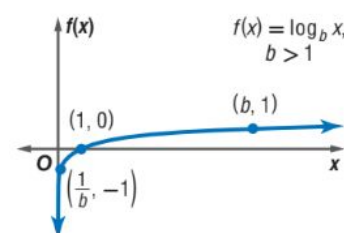
a. $10^{\log 4}$

b. $\log_5 5^x$

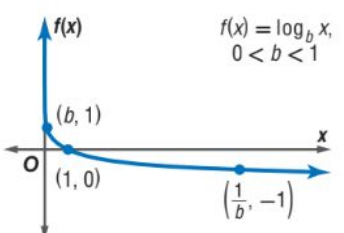
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KeyConcept Parent Function of Logarithmic Functions 

Parent function:	$f(x) = \log_b x$	Type of graph:	continuous, one-to-one
Domain:	all positive real numbers	Range:	all real numbers
Asymptote:	$f(x)$ -axis	Intercept:	(1, 0)



$f(x) = \log_b x$
 $b > 1$

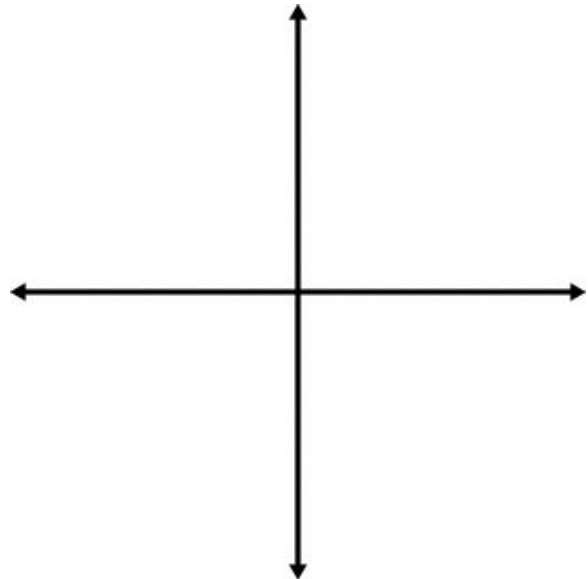
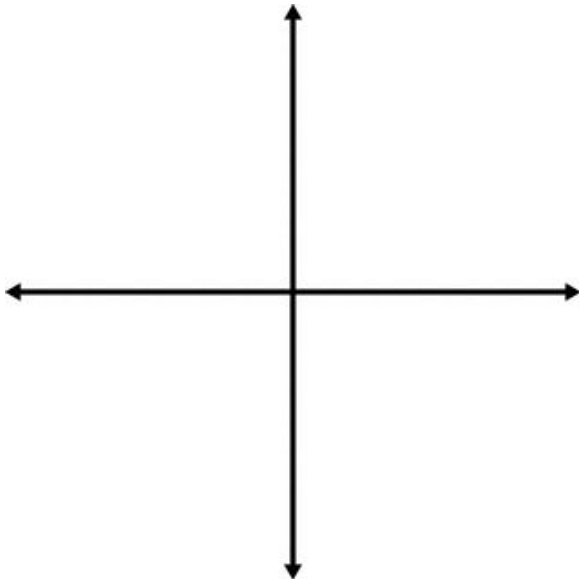


$f(x) = \log_b x$
 $0 < b < 1$

5. Graph the following and state the domain and range:

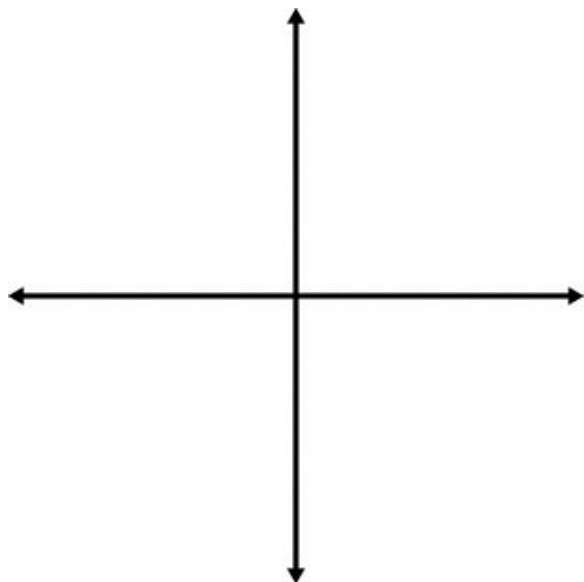
a. $y = \log_2 x$

b. $y = \log_{0.5} x + 2$



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



d. $y = \log_{1/4}(x + 2) - 1$

