

F.BF.B.4: Inverse of Functions 3

- If $f(x) = a^x$ where $a > 1$, then the inverse of the function is
 - $f^{-1}(x) = \log_x a$
 - $f^{-1}(x) = a \log x$
 - $f^{-1}(x) = \log_a x$
 - $f^{-1}(x) = x \log a$
- The inverse of a function is a logarithmic function in the form $y = \log_b x$. Which equation represents the original function?
 - $y = b^x$
 - $y = bx$
 - $x = b^y$
 - $by = x$
- What is the inverse of the function $y = \log_3 x$?
 - $y = x^3$
 - $y = \log_x 3$
 - $y = 3^x$
 - $x = 3^y$
- What is the inverse of the function $f(x) = \log_4 x$?
 - $f^{-1}(x) = x^4$
 - $f^{-1}(x) = 4^x$
 - $f^{-1}(x) = \log_x 4$
 - $f^{-1}(x) = -\log_x 4$
- Which equation defines a function whose inverse is *not* a function?
 - $y = |x|$
 - $y = -x$
 - $y = 3x + 2$
 - $y = 2^x$
- Which two functions are inverse functions of each other?
 - $f(x) = \sin x$ and $g(x) = \cos(x)$
 - $f(x) = 3 + 8x$ and $g(x) = 3 - 8x$
 - $f(x) = e^x$ and $g(x) = \ln x$
 - $f(x) = 2x - 4$ and $g(x) = -\frac{1}{2}x + 4$
- Consider the function $f(x) = 2^x$. Is $f(x)$ an even function? Justify your answer. Write an equation for $g(x)$, the function that results after $f(x)$ is shifted up 5 units. Write an equation for $h(x)$, the inverse of $g(x)$.

F.BF.B.4: Inverse of Functions 3**Answer Section**

1 ANS: 3 REF: 011917aii

2 ANS: 1

$$y = \log_b x$$

$$x = b^y$$

$$y = b^x$$

REF: 060115b

3 ANS: 3 REF: 011708aii

4 ANS: 2 REF: 061521a2

5 ANS: 1 REF: 068932siii

6 ANS: 3 REF: 081027a2

7 ANS:

No, because $f(-x) = 2^{-x}$ $g(x) = f(x) + 5$ $y = 2^x + 5$

$$2^{-x} \neq 2^x \qquad x = 2^y + 5$$

$$\log(x - 5) = \log 2^y$$

$$\frac{\log(x - 5)}{\log 2} = \frac{y \log 2}{\log 2}$$

$$\frac{\log(x - 5)}{\log 2} = h(x)$$

REF: 082435aii