

- Composition of Functions
 - Finding Inverse Functions Algebraically
 - Finding Inverse Functions Graphically (reflecting over $y = x$)
 - One-to-One Functions (horizontal line test)
 - Laws of Exponents (zero and negative exponents)
 - Fractional Exponents
 - Solving Exponential Equations
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Practice:

1. If $R = \{(-2,3), (a,4), (1,9), (0,7)\}$, which replacement for a makes this relation a function?
(1) 1 (3) 0
(2) -2 (4) 4
2. If $f(x) = x - 10$ and $g(x) = 10 - 2x$ and $f(x) = g(x) + 10$, then x is
(1) 1 (3) -1
(2) 10 (4) -10
3. If $h(x) = -2x^2 + x - 3$, find each of the following in simplest form:
a) $h(-x)$.
b) $h(x+2)$.
4. If $f(x) = x^2 - 2x$, $g(x) = 3 - 8x$, and $h(x) = 4x - 1$, find each of the following in simplest form.
a) $(f \circ h)(x)$ b) $(h \circ g)(x)$ c) $(g \circ g)(x)$ d) $(g \circ f)(x)$
5. If $g(x) = \frac{1}{x-2}$, where $x \neq 2$, what is $g^{-1}\left(\frac{1}{2}\right)$?
6. If $f(x) = \frac{3}{x^2-1}$ and $g(x) = \frac{1}{x+1}$, then find each of the following in simplest form.
a) $(f \circ g)(x)$ b) $(g \circ f)(x)$ c) $(g \circ g)(x)$
7. Evaluate:
a) $\left(\frac{2}{3}\right)^{-3}$ b) $(-27)^{-\frac{4}{3}}$ c) $\left(\frac{1}{125}\right)^{-\frac{1}{3}}$
8. Simplify and express with positive exponents only:
$$\frac{(a^3b^{-2})^2}{a^{-3}b^3}$$

9. Solve for x :

$$\left(\frac{1}{2}\right)^{x-4} = 16^{5x}$$

10. Find $f^{-1}(x)$ if $f(x) = -5x + 2$.

11. Which of the following is a one-to-one function?

- (1) $y = x^2$ (3) $y = x$
(2) $x = y^2$ (4) $y = |x|$

12. Find the inverse of the function $f(x) = \frac{2}{3}x + 1$ and sketch both f and f^{-1} on the accompanying grid. State the coordinates of a point on the inverse function.

