Name_____ Date_____ Period_____

INVERSE FUNCTIONS WORKSHEET

An inverse relation interchanges the input and output values of the original relation which means the domain and range are also interchanged. The graph of an inverse relation is a reflection of the graph of the original relation over the line $y = x$.
To find an inverse: 1) Replace $f(x)$ with y. 2) Switch the x and the y. 3) Solve for x.
To verify inverses, show: $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$

Given $f(x) = x^2 + 1$, $g(x) = \sqrt{x+4}$, and $h(x) = x + 6$, find the following:

1. $f(g(x))$ 2. $f(h(x))$ 3. $h(f(x))$

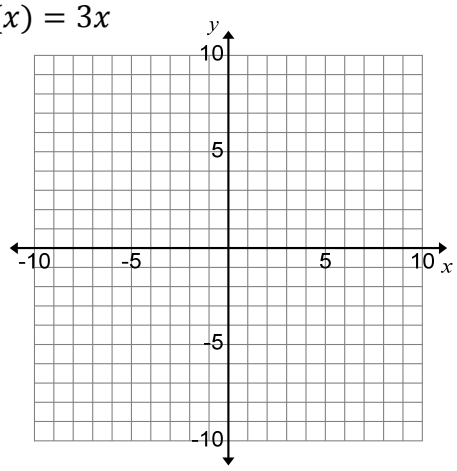
Verify that the following functions are inverses.

4. $f(x) = 7x + 1$ and $g(x) = \frac{x-1}{7}$ 5. $f(x) = \sqrt{x-4}$ and $g(x) = x^2 + 4\ (x \geq 0)$

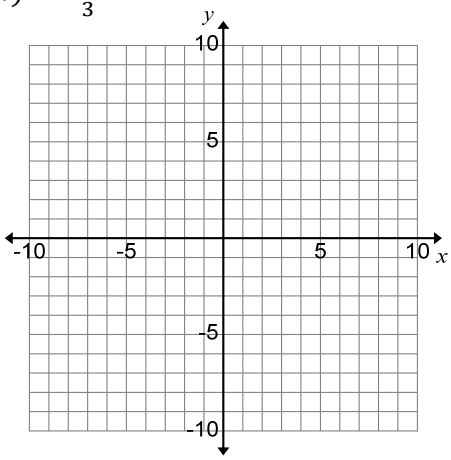
6. $f(x) = 1 - x^3$ and $g(x) = \sqrt[3]{1-x}$ 7. $f(x) = 9 - x^2$ and $g(x) = \sqrt{9-x}\ (x \leq 9)$

Find the inverse of each function graphically. Graph the function and its inverse on the same graph.

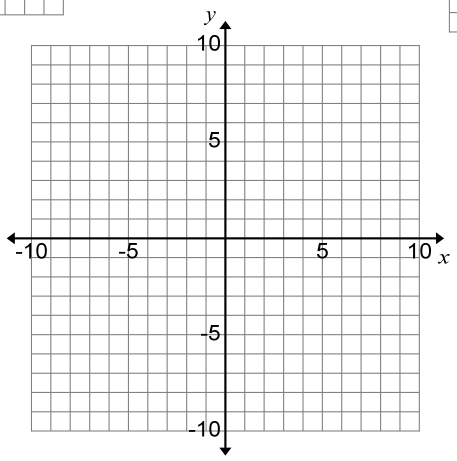
8. $f(x) = 3x$



9. $g(x) = \frac{x-1}{3}$



10. $f(x) = \sqrt[3]{x}$



Using a graphing calculator, determine if the function has an inverse. If yes, find the inverse algebraically. If no, explain why.

11. $f(x) = 2x - 3$

12. $f(x) = \sqrt{x}$

13. $f(x) = \frac{4}{x}$

14. $f(x) = \frac{x}{8}$

15. $f(x) = -\frac{4}{x^2}$

16. $f(x) = |x - 2|$