<u>Worksheet 5 – Inverse Functions (§3.7)</u>
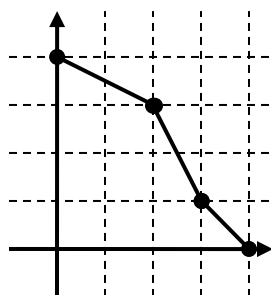
1. Given the invertible functions $f = \{(-3,4),(-2,2),(-1,0),(0,1),(1,3),(3,-1)\}$ and
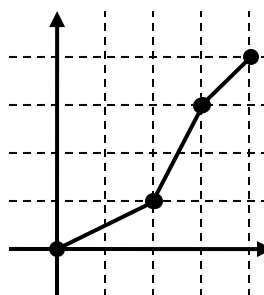 $g = \{(-3,-2),(-2,0),(-1,-4),(1,-3),(2,1),(3,2)\}$, compute the following values.

       (a) $f^{-1}(3)$ (c) $g^{-1}(2)$ (e) $(f^{-1} \circ g^{-1})(-4)$
       (b) $f^{-1}(4)$ (d) $g^{-1}(0)$ (f) $(g^{-1} \circ f^{-1})(1)$

2. Use the graphs below to compute the following values.

       (a) $f^{-1}(3)$ (c) $g^{-1}(1)$ (e) $(f^{-1} \circ g^{-1})(0)$
       (b) $f^{-1}(4)$ (d) $g^{-1}(4)$ (f) $(g^{-1} \circ f^{-1})(1)$

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

3. Sketch the graphs of the inverses of the functions given in the previous exercise.

4. Show/provide reason for whether or not the following functions are invertible. Then if a
   function is invertible, compute its inverse.

       (a) $f = \{(3,-2),(2,6),(10,4),(0,1),(-3,6)\}$ (d) $f(x) = |x|$
       (b) $f = \{(1,-3),(-3,4),(0,-1),(2,2)\}$ (e) $f(x) = \frac{x}{2x+1}$
       (c) $f(x) = \sqrt[3]{x} - 4$ (f) $f(x) = \frac{1}{x^4+1}$

5. For each given pair of functions, use composition to show that they are inverses.

       (a) $f(x) = \frac{x-2}{3} + 4$, $g(x) = 3x - 10$ (c) $f(x) = \frac{x-2}{2x-1}$, $g(x) = \frac{x-2}{2x-1}$
       (b) $f(x) = \sqrt[5]{3x - 1}$, $g(x) = \frac{1}{3}x^5 + \frac{1}{3}$

6. Compute the inverse of the following invertible functions. Then graph both the function
   and its inverse on the same set of axes.

       (a) $f = \{(3,-2),(1,3),(0,2),(-2,1)\}$ (c) $f(x) = \sqrt[3]{x - 2}$
       (b) $f(x) = 3 - 2x$ (d) $f(x) = \sqrt{x + 2}$

7. Complete the following rule: "If a function and its inverse are graphed on the same axes,
   then their graphs are _____."