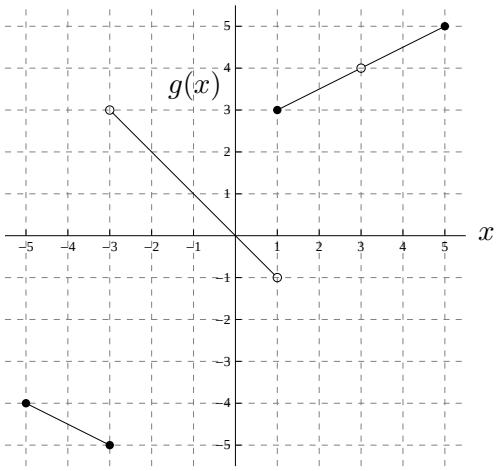
2. [13 points] Below is a table of values for an invertible, differentiable function $f(x)$ and the graph of a function $g(x)$. Use these to answer the following questions:

x	0	1	2	3	4	5
$f(x)$	8	7	3	2	1.5	1



a. [1 point] Give one number in the interval $[-5, 5]$ that is *not* in the domain of g.

Solution: 3

b. [1 point] Give one number in the interval $[-5, 5]$ that is *not* in the domain of g^{-1}.

Solution: Anything in $(-4, -1] \cup \{4\}$. For example, 4.

c. [8 points] Evaluate the following:

(i) $f(f(5))$

Solution: $f(f(5)) = f(1) = 7$.

(ii) $g^{-1}(f^{-1}(2))$

Solution: $g^{-1}(f^{-1}(2)) = g^{-1}(3) = 1$.

(iii) $\lim_{x \to 3} g(x)$

Solution: 4, found from graph of g.

(iv) $g'(1 + f(2))$

Solution: $g'(1 + f(2)) = g'(4) = \dfrac{1}{2}$ looking at the slope on the graph of g at $x = 4$.

d. [3 points] Approximate $f'(3)$. (Be sure to show your work.)

Solution: Acceptable answers: -1, $-\frac{1}{2}$, $-\frac{3}{4}$. Found approximating the derivative via a difference quotient.