Exam I

Spring 2012

Name_____

Instructions. Work all the problems out very precisely and show all your work.

1. **6 points** Given $f(x) = x^2 + 2x - 1$, compute and simplify

$$\frac{f(a+h) + f(a)}{h}$$

2. **9 points** Given

$$f(x) = \frac{1}{1-x}$$

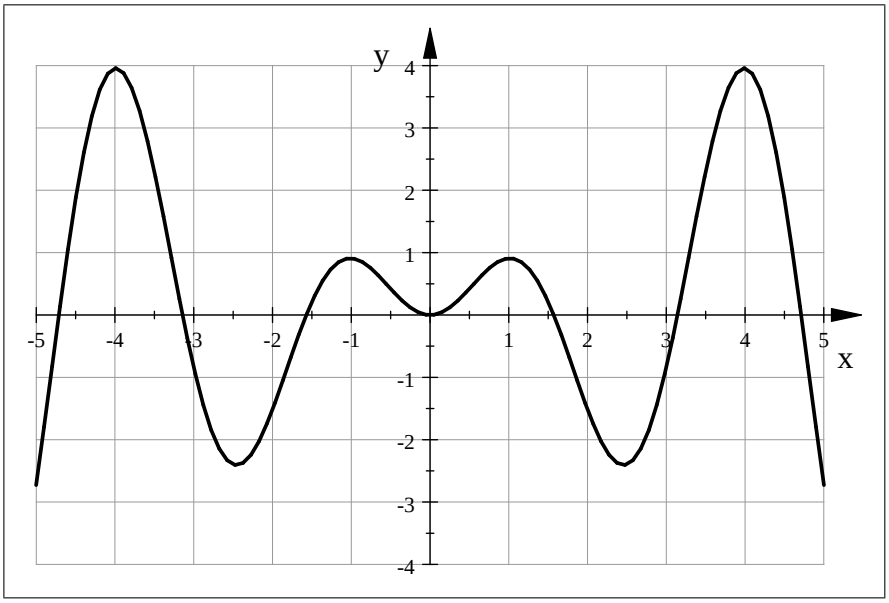
(a) Find the domain of f.

(b) Explain why the function f is one-to-one.

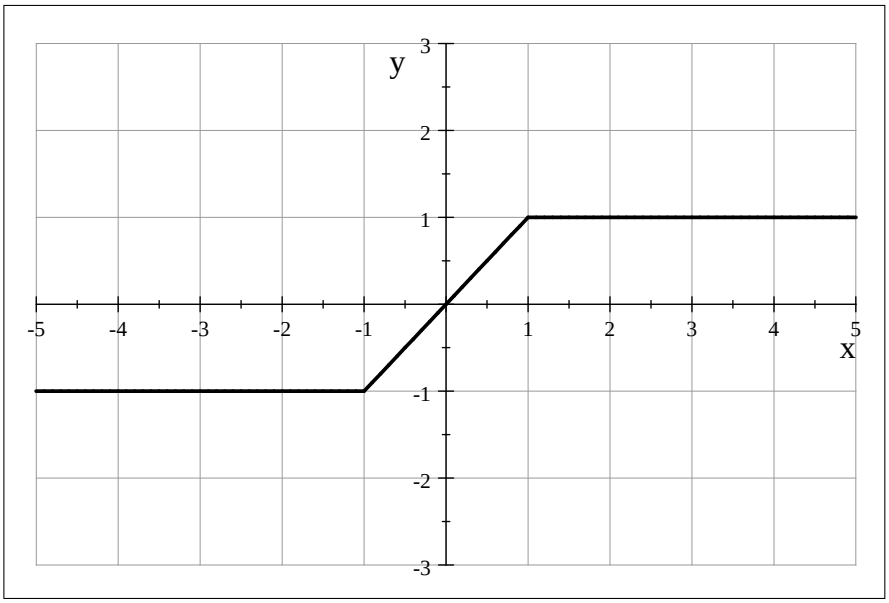
(c) Find $f^{-1}(x)$.

3. **6 points**

(a) Given the graph of $f(x)$, plot the graph of $-f(x)$ together with the graph of $f(x)$.



(b) Given the graph of $g(x)$ below, plot the graph of $2g(2x-1)$ together with the graph of $g(x)$.



4. **6 points** Find the equation of the line passing through the point of coordinates $(1, 2)$ and parallel to the line $x + y = 1$ in

   (a) Point-slope form.

   (b) Slope-intercept form.

5. **9 points** Given the following quadratic, $f(x) = x^2 - 2x + 3$

   (a) Find the coordinates of the vertex of the graph of f.

   (b) Find the domain and range of f.

   (c) Sketch the graph of f.

6. **2 points** Suppose that $g(x) = x^3 + x^5$. Evaluate

$$\left(g^{-1}(4)\right)^3 + \left(g^{-1}(4)\right)^5 + 1.$$