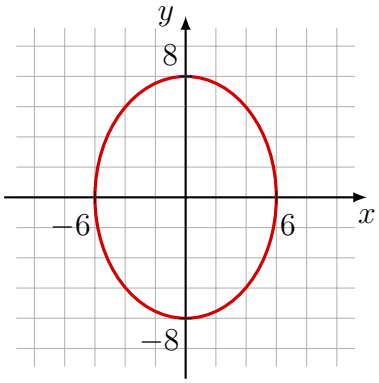
MATH 120
WINTER 2014 NAME:
EXAM 3

1. [10 pts.] Write an equation in slope-intercept form for the line through $(-2, -7)$ and parallel to $3x - 4y = 2$.

2. [10 pts.] Write an equation in slope-intercept form for the line through $(2, -4)$ and perpendicular to $8x - 3y = 6$.

3. [10 pts.] Give the domain and range of the relation given by the graph below. Is the relation a function?



4. [10 pts.] Let $f(x) = x^2 + \sqrt[3]{x}$. Find $f(-8)$ and $f(c)$.

5. [10 pts. each] Find the domain and range of each function.
   (a) $y = x^5$
   (b) $y = |x| - 9$

6. [10 pts. each] Find the domain of each function (not the range).
   (a) $\alpha(x) = \dfrac{x+1}{3x-2}$
   (b) $\beta(x) = \sqrt{x-5}$
   (c) $\gamma(x) = \sqrt{64 - x^2}$

7. [10 pts. each] Refer to the functions α, β, γ in Problem 6. There is no need to simplify any of your expressions, but domains must be explicit.
   (a) Find $\alpha + \gamma$ and its domain.
   (b) Find α/β and its domain.
   (c) Find $\beta \circ \beta$ and its domain.
   (d) Find $\beta \circ \gamma$ and its domain.

8. [10 pts.] Let $H(x) = \dfrac{18}{(7-2x)^{10}}$. Find functions f and g such that $f \circ g = H$.

9. [10 pts.] Show the function $f(x) = 2x^3 - 1$ is one-to-one.

10. [10 pts.] Show that $g(x) = (x+1)(x-12)$ is not one-to-one.

11. The function $f(x) = \dfrac{4x+1}{x-10}$ is one-to-one.

    (a) [10 pts.] Find the inverse f^{-1} of f.

    (b) [5 pts.] Find the range of f.

    (c) [5 pts.] Find the range of f^{-1}.