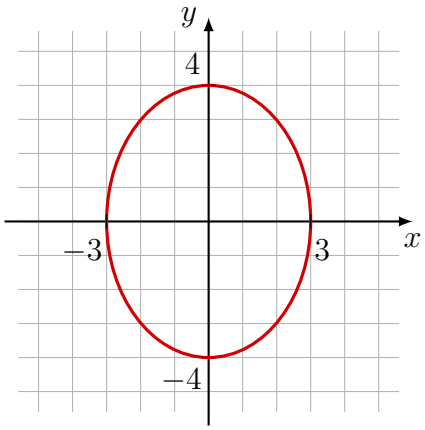
MATH 120
SPRING 2013
EXAM 3

NAME:

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 $r(x) = x^2 + \sqrt{x+2}$. Find $r(7)$ and $r(-1)$.

5. [10 pts.] Find the domain and range of $p(x) = |x + 2| - 5$.

6. [10 pts. each] Find the domain of the function in interval notation.

   (a) $f(x) = \dfrac{2x - 5}{x + 7}$

   (b) $g(x) = \sqrt{4 - 5x}$

   (c) $h(x) = \dfrac{\sqrt{x + 9}}{x - 8}$

7. [10 pts. each] Refer to the functions f, g, and h in the previous problem.

   (a) Find fg and its domain.

   (b) Find h/f and its domain.

   (c) Find $f \circ f$ and its domain.

   (d) Find $g \circ g$ and its domain.

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

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

10. [10 pts.] Show that $g(x) = (x-10)(x-3)$ is not one-to-one.

11. The function $f(x) = \dfrac{x+1}{2x-3}$ is one-to-one.

    (a) [10 pts.] Find the inverse of f.

    (b) [10 pts.] Find the range of f and the range of f^{-1}.