

MATH 120
FALL 2014
EXAM 3

NAME:

1. 10 pts. Write an equation in slope-intercept form for the line through $(5, -3)$ and parallel to $-6x + 2y = 3$.
2. 10 pts. Write an equation in slope-intercept form for the line through $(1, 9)$ and perpendicular to $4x - 3y = 6$.
3. 10 pts. Give the domain and range of the relation $2x + y > 10$. Is the relation a function?
4. 10 pts. each Give the domain and range of each function in interval notation.
 - (a) $y = \sqrt{x} + 3$
 - (b) $y = |x| - 25$
5. 5 pts. each Give the domain of each function in interval notation.
 - (a) $\varphi(x) = \frac{x+1}{4-x}$
 - (b) $\omega(x) = \sqrt{x+4}$
 - (c) $\psi(x) = \sqrt{81-x^2}$
6. 10 pts. each Refer to the functions φ, ω, ψ in Problem 5. There is no need to simplify any of your expressions, but domains must be put into interval notation.
 - (a) Find $\varphi + \psi$ and its domain.
 - (b) Find φ/ω and its domain.
 - (c) Find $\omega \circ \omega$ and its domain.
 - (d) Find $\omega \circ \psi$ and its domain.
7. 10 pts. Let $H(x) = \sqrt[5]{2x-9}$. Find functions f and g , neither equal to H , such that $f \circ g = H$.
8. 10 pts. Show the function $f(x) = 2x^3 - 1$ is one-to-one.
9. 10 pts. Show that $g(x) = x^6 - 12$ is not one-to-one.
10. The function $f(x) = \frac{x+2}{1-3x}$ 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} .