

MATH 120
SUMMER 2015
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. 5 pts. Write an equation for the line through $(30, 16)$ which has undefined slope.
4. 10 pts. each Give the domain and range of each function in interval notation.

 - (a) $y = \sqrt{x} + 3$
 - (b) $y = 7 - |x|$
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 $g(x) = x^4 + x^2$ is not one-to-one.
10. The function $f(x) = \frac{4}{x}$ 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} .