1. [10 pts.] Write an equation in slope-intercept form for the line through $(-1, 5)$ and parallel to $3x - 5y = 1$.

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

3. [10 pts.] Explain why the relation $x = y^6$ is not a function. Also give the domain and range.

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

5. [10 pts. each] Find the domain and range of each function.

   (a) $xy = 2$

   (b) $y = |x| - 8$

6. [5 pts. each] Find the domain of each function (not the range).

   (a) $\alpha(x) = \dfrac{x + 1}{3x - 2}$

   (b) $\beta(x) = \sqrt{9x - 5}$

   (c) $\gamma(x) = \sqrt{16 - x^2}$

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 $\alpha\beta$ and its domain.

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

   (d) Find $\beta \circ \gamma$ and its domain.

8. [10 pts.] Let $\Omega(x) = (2x - 3)^8$. Find functions f and g such that $f \circ g = \Omega$.

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

10. [10 pts.] Show the function $g(x) = 3x^2 - 4$ is not one-to-one.

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

EXTRA CREDIT (20 PTS.): Find the domain of
$$F(x) = \sqrt[6]{\dfrac{x^2 + 2x}{x - 3}}$$