HOMEWORK 1 - MATH 112
DUE DATE: Monday, January 19
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Find the slope and the y-intercept of the line with equation $2x - 3y = 24$.

2. Find the equation of the line that is parallel to $4x - 2y = 3$ passing through $(2, 1)$ and the equation of the line that passes through $(1, 1)$ and is perpendicular to $-2x + 3y = -3$.

3. Find the domain, graph the function and then find the codomain of the functions

    (a) $f(x) = \frac{|x|}{x}$
    (b) $f(x) = x^2 - 6x + 8$

4. Find the inverse f^{-1} of $f(x) = \sqrt{9 - x^2}, 0 \le x \le 3$, and sketch the graphs of f and f^{-1} on the same axes.

5. Find the limits $\lim_{x \to 0} f(x)$ and $\lim_{x \to 0} g(x)$ for the following functions

6. Find the following limits

    (a) $\lim_{x \to 3} (3x + 2)$
    (b) $\lim_{x \to 3} \sqrt{x + 1}$
    (c) $\lim_{x \to 7} \frac{3x}{x+2}$
    (d) $\lim_{x \to 3} \frac{\sqrt{x+1}}{x-4}$

7. Find the limits

    (a) $\lim_{x \to -1} \frac{x^2-1}{x+1}$
    (b) $\lim_{x \to -2} \frac{x^3+8}{x+2}$
    (c) $\lim_{x \to 2} \frac{2-x}{x^2-4}$
    (d) $\lim_{x \to 3} f(x)$, where $f(x) = \begin{cases} \frac{1}{3}x - 2, & \text{if } x \le 3 \\ -2x + 5, & \text{if } x > 3 \end{cases}$

8. Discuss the continuity of $f(x) = \frac{1}{x^2-4}$ and $g(x) = \frac{1}{4+x^2}$.