HOMEWORK 1 - MATH 112 DUE DATE: Monday, January 17 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 3x + 7y = 12.
- 2. Find the equation of the line that is parallel to 3x 2y = 5 passing through (-2, 1) and the equation of the line that passes through (3, 1) and is perpendicular to 2x + 3y = -3.
- 3. Find the domain, graph 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 $f(x) = x^3 + 2$ 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) $\lim_{x\to 3} (2x-5)$
 - (b) $\lim_{x \to 5} \sqrt{x+11}$
 - (c) $\lim_{x \to 7} \frac{5x}{2x+3}$
 - (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 $f(x) = \frac{1}{x^2-9}$ and $g(x) = \frac{1}{3+x^2}$.