MAT 1500 (Dr. Fuentes) Worksheet 1 - Sections 1.1 & 1.3

Section 1.1: Four Ways to Represent a Function

Problem 1. In each of the following equations, please determine whether y is a function of x and if x is a function of y. Please support your answers with an explanation.

(a) $x^2 + (y-3)^2 = 5$ (b) $x + (y-3)^3 = 5$

Problem 2. Sketch the graph of each of the following functions.

(a) $f(x) = \dfrac{|x+1|}{x+1}$ (b) $g(x) = ||x| - 1|$

Problem 3. Find the domain of each of the following functions:

$$(a)\ f(x) = \frac{\sqrt{x^2-1}}{x-2}, \qquad (b)\ g(x) = \frac{1}{\sqrt[4]{x^2-5x}}.$$

Please state your answer in set or interval notation.

Section 1.3: New Functions from Old Functions

Problem 4. Use the graph of $f(x) = \sin(2x)$ to sketch the graph of $g(x) = |\sin(2x)|$.

Problem 5. Let $f(x) = \dfrac{1}{x-1}$ and $g(x) = \sqrt{x-1}$.

Find $f+g$, $f-g$, fg, and f/g and state each of their domains.

Problem 6. Given $F(x) = \sqrt[3]{x^2+1} + 6$, find functions f, g, and h such that $F = f \circ g \circ h$.