

Math 190 Homework 1: Due Monday September 19

The assignment is due at the beginning of class on the due date. You are expected to provide full solutions, which are laid out in a linear coherent manner. Your work must be your own and must be self-contained. Your assignment must be stapled with your name and student number at the top of the first page.

Questions:

1. Find all $x \in \mathbb{R}$ such that

$$x^4 - 2x^2 - 1 = 0.$$

2. Find all (real) zeros of

$$g(x) = \begin{cases} x^2 - 9, & x \leq 0 \\ -\frac{1}{3}(x - 5) + 1, & x > 0 \end{cases}.$$

Consider sketching the graph of g .

3. Find all real t such that the function

$$f(x) = \begin{cases} 2x + 3, & x \geq t \\ 2x^2 + x - 5, & x < t \end{cases}$$

is continuous. Support your answer with one or more pictures.

4. The absolute value function is defined as

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}.$$

- (a) Plot $|x|$.
(b) Plot $g(x) = |3x - 7|$.
(c) Write g as a piecewise function.
5. Consider the function

$$f(x) = \frac{1}{\sqrt{x+1} - 1}.$$

- (a) Find the *domain* of function f .
(b) The *range* of a function is the set of all possible output values of said function. Determine the range of f .