

Math 190 Homework 5: Due Monday October 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. Enjoy this short assignment for this short week!

Questions:

1. Consider the function $f(x) = \frac{1}{x}$.
 - (a) Find the slope of the secant line passing through the points $(2, 1/2)$ and $(1.5, 1/1.5)$ (feel free to use a calculator).
 - (b) Find the slope of the secant line passing through the points $(2, 1/2)$ and $(1.9, 1/1.9)$.
 - (c) Find the slope of the secant line passing through the points $(2, 1/2)$ and $(1.99, 1/1.99)$.
 - (d) What do you think the slope of the tangent line at $(2, 1/2)$ is?
2. Using a limit find the slope of the tangent line to $f(x) = 1/x$ at $(2, 1/2)$. Was your prediction in Question 1 correct?
3. Using the limit definition of the derivative (and not any other method) find the derivative of the function

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

and use it to compute the slope of the tangent line to $f(x)$ at $x = 4$.