

Name: _____

MATH 361

Spring 2024

HW 2: Due 02/01

“You say impossible, but all I hear is, ‘I’m possible.’”

— *Ted Lasso, Ted Lasso*

Problem 1. (10pts) bisection

Problem 2. (10pts) newton

Problem 3. (10pts) secantmethod

Problem 4. (10pts) If $f: \mathbb{R} \rightarrow \mathbb{R}$ is a function, we say that p is a fixed point for f if $f(p) = p$.

(a) If $f(x)$ has a fixed point, explain why the graph of $f(x)$ must intersect the line $y = x$.

(b) Must all the fixed points for $f(x)$ lie along the line $y = x$? Explain why or why not.

One method of finding a root for a function $f(x)$ is fixed

(— Problem 4 Continued —)

Problem 5. (10pts) Watch 3Blue1Brown's video [From Newton's method to Newton's fractal \(which Newton knew nothing about\)](#) on YouTube and then being as detailed as possible, respond to the following:

- (a) What application of finding roots for polynomials did the video discuss to motivate Newton's method?
- (b) How did the domain for the functions $P(z)$ the video considers differ from what we did in class?
- (c) What is the connection between Newton's method and fractals?
- (d) What was interesting or surprising to you in the video?