

Quiz # 2

Name: _____

Date: 25/9/2024

Math 128A - 106: Fall 2024

For full credit, please clearly show all your work.

Problem 1

Consider the fixed point iteration $x_{n+1} = g(x_n)$ where $g(x) = 3(\frac{x}{2} + 2)^{-1}$ with initial guess $x_0 = 0$. Show that the fixed point iteration converges.

Problem 2

Consider the sequence $\{x_n\}$ where $x_n = \frac{1+n}{2n^3}$.

1. Find the limit as $n \rightarrow \infty$.
2. Find the order of convergence. (Recall: If $\lim_{n \rightarrow \infty} \frac{|x_{n+1}-x|}{|x_n-x|^\alpha} = C$, what is the order of convergence?)