

Name: _____

Email: _____

Math Club: Biweekly Contest Week Two

Release Date: February 14, 2024

Instructions: Solve the following problem as best you can. The first student to submit the correct solution via email to tamumathcontest@gmail.com or to Jeremy Kubiak in Blocker 336D (with time stamp) wins!

Problem 1. Suppose $a \neq -1$. If $f : \mathbb{R} \rightarrow \mathbb{R}$ such that $f(x) + a \cdot f(1 - 1/x) = x$, then show

$$\lim_{x \rightarrow \pm\infty} (x - (1 + a^3) \cdot f(x)) = a.$$