Math Club: Biweekly Contest Week Seven

Release Date: November 29, 2023

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. Using formal power series show that for $|x| < 1$ we have

$$\frac{1}{1-x} = \sum_{0 \leq n} x^n \implies \frac{x}{(1-x)^2} = \sum_{0 \leq n} n x^n \implies \frac{x^2 + x}{(1-x)^3} = \sum_{0 \leq n} n^2 x^n.$$