PoTW 17: Week of 9-16-2021

Problem of the Week at shsmathteam.com

Submission form: link to submit

For hints: andliu22@students.d125.org

Alternatively, you can message Andrew Liu on Facebook Messenger. Please don't be afraid to reach out for help, asking for hints is heavily encouraged if you feel stuck.

Problem of the Week #17: 777 (part 2)

Number Theory

Let x_n be the smallest positive integer such that 7^n divides $x_n^2 - 2$. Compute $x_1 + x_2 + x_3$.

(*Optional challenge: prove that x_n is well defined for all $n \geq 1$.*)