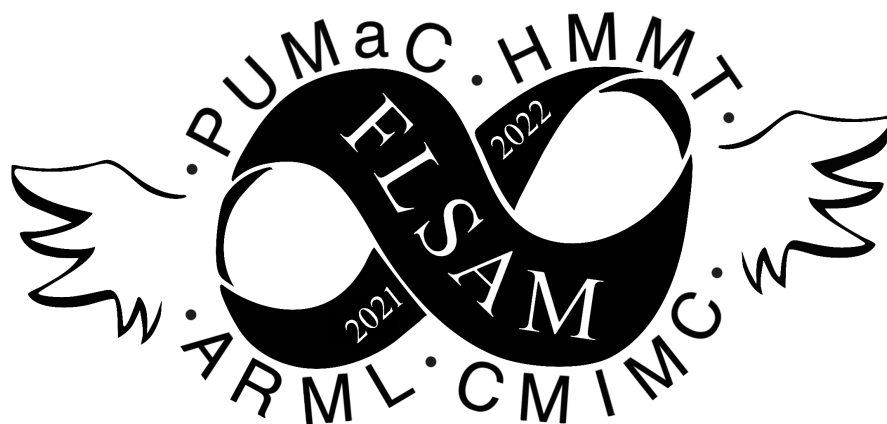# Florida Student Association of Mathematics

2022 ARML Tryout

Set 4 of 7

Welcome to the **2022 FLSAM ARML Tryout!** The tryout will consist of **7 sets** of **2 problems each**. You will have **10 minutes** to work on each set. Write your name and answers directly on each problem set. Scoring is based on the number of correct answers; there is no penalty for wrong answers. Good luck!

Round 4   Name: _____

7. _____   8. _____

7. Let the nth triangular number $T_n = 1 + 2 + 3 + \cdots + n$ and

$$P_n = \frac{T_2}{T_2 - 1} \cdot \frac{T_3}{T_3 - 1} \cdot \ldots \cdot \frac{T_n}{T_n - 1}.$$

Given that the product P_{2022} can be written as $\frac{m}{n}$ for relatively prime positive integers m and n, determine $m + n$.

8. Find the sum of all positive integers $x < 43$ such that $2x^3 + 2x + 1$ is divisible by 43.