

University of Washington Math Olympiad 2026

Grades 8–10

Problem #6 Raman writes a positive integer N on a board. Then he writes $N + 1$ immediately to its right, without spaces, then $N + 2$, then $N + 3$, and so on, so that the number on the board keeps getting longer.

For example, if he starts with $N = 97$, then after 5 steps, the number on the board is 979899100101.

Show that if Raman starts with a 100-digit number, then after some number of steps, the number on the board will be divisible by 101.

Problem #7 Ten fluffy cats are sitting on a long fence. Every minute, some pair of cats hiss at each other, and then each jumps 1 meter away from the other along the fence. If the two cats are at the same spot when they hiss, they jump 1 meter in opposite directions.

Show that after 2026 minutes, there must be two cats more than 162 meters apart.

