

# University of Washington Math Olympiad 2026

## Grades 8–10

**Problem #1** Call a positive integer *silly* if all of its digits are 6s and 7s. For example, the five numbers 76, 67, 6, 6, and 7 are silly. Their sum is 162, which is not silly. Can five silly numbers sum to a silly number, or is that just too silly?



**Problem #2** The alphabet of the Aau–Bau language consists of two letters: A and B. The king decides on a list of banned 3-letter sequences: no valid word can contain any of these banned sequences.

For example, if BBB and BAB are banned, then the words ABABA and AABBB are invalid (because the first contains BAB, and the second contains BBB), but BBAAB is valid.

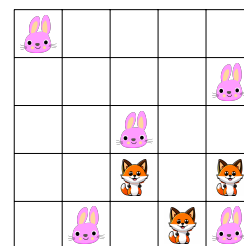
What is the smallest number of 3-letter sequences that can be banned to make every 10-letter word invalid?

**Problem #3** Mycroft locks a door with a magical  $10 \times 10$  grid, which is filled with all the integers from 1 to 100 in some order. Whenever Sherlock knocks on the door, the numbers in the grid magically rearrange themselves. First, the numbers in each row are sorted from left to right in increasing order. Next, the numbers in each column are sorted from top to bottom in increasing order.



The door unlocks if Sherlock knocks and none of the numbers move. Is it possible for Mycroft to arrange the numbers in the grid so that no matter how many times Sherlock knocks, the door never unlocks?

**Problem #4** The rabbits and foxes in Professor Owl's class sit in a  $5 \times 5$  grid of desks. Each desk has at most one animal but some desks may be empty. Every pair of rabbits in the same row or column must have at least one fox sitting somewhere between them. Professor Owl's class has 10 rabbits. What is the smallest number of foxes it could have?



**Problem #5** On the island of Artinia, some cities are connected with two-way roads. There are no one-way roads, and any pair of cities is connected by at most one road. If the government were to close any one road for repairs, it would still be possible to drive from any city to any other city. Show that the government could carefully pick a direction for every road to make it one-way, and it would still be possible to drive from any city to any other city when all the roads are open.