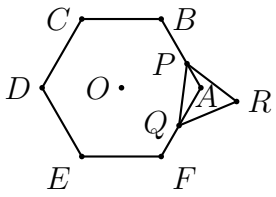
WISCONSIN MATHEMATICS, SCIENCE & ENGINEERING TALENT SEARCH

PROBLEM SET IV (2025–2026) **January 2026**

1. Bucky writes the sixteen digits $2, 2, 3, 3, 4, 4, 5, 5, 6, 6, 7, 7, 8, 8, 9, 9$ in some order next to each other and then places a division symbol (/) somewhere between two digits, creating a division problem. Can the result of this calculation be 2?

2. Find all positive integers n for which the interval $[n, 1.5n]$ does not contain a perfect square.

3. Let $ABCDEF$ be a regular hexagon with center O. Draw equilateral triangle $\triangle PQR$ so that P lies on side $\overline{AB}$, Q lies on the side $\overline{FA}$, and A lies inside the triangle $\triangle PQR$. Let S be the center of $\triangle PQR$ and assume that this is not A. Compute the $\angle OAS$.



4. A company had 2026 expenses, each given in dollars and cents. Each accountant in the company calculated the approximate total expense as follows. The accountant chose two numbers from the list of expenses, added them, rounded the sum down to the nearest dollar, and replaced the pair of numbers with one number equal to their rounded sum. Next, the accountant chose two numbers from the remaining 2025 numbers and repeated the procedure. After 2025 such steps, one number remained, which was declared the approximate total.

After all the accountants finished their calculations, it turned out that all of them obtained different results. What is the maximum possible number of accountants in the company?

5. Alex wrote 2026 proper fractions on the board. (A proper fraction is the ratio of two positive integers where the ratio is less than one.) He noticed that for some positive integer k, every integer 1, 2, 3, ..., k can be written as the sums of fractions Alex wrote on the board. What is the greatest possible value of k?

You are invited to submit a solution even if you get just one problem. Please do not write your solutions on this problem page. Remember that solutions require a proof or justification.

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