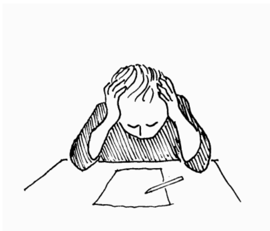


The Georg Mohr Contest 2026
Second Round

Tuesday, 13 January 2026 at 9–13

Aids permitted: only writing and drawing tools.
Remember that your arguments are important in the assessment
and that points may also be awarded to partial answers.

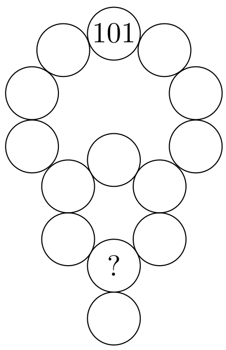
Problem 1. In the following subtraction all the digits A, B, C, X and Y must be different, and none of them may be 0.

$$\begin{array}{r} \mathrm{A\,B\,C} \\ -\,\mathrm{C\,B\,A} \\ \hline \mathrm{1\,X\,Y} \end{array} \qquad \text{Example:} \qquad \begin{array}{r} 563 \\ -365 \\ \hline 198 \end{array}$$

In how many different ways can the digits be chosen?

Problem 2. In the figure a number has to be written in each circle. The number 101 is already written in the topmost circle. The sum of the number in a circle and the numbers in its neighbouring circles is called the circle's *Mohr-sum*. Georg writes a number in each circle so they all have the same Mohr-sum.

Is it possible to determine which number Georg writes in the circle marked with a question mark?



Problem 3. For a positive integer $n > 1$ one considers the $n-1$ fractions

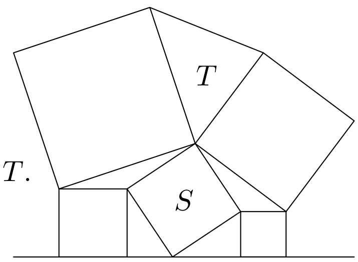
$$\frac{1}{n},\ \frac{2}{n},\ \frac{3}{n},\ \ldots,\ \frac{n-1}{n}.$$

All the fractions are reduced as much as possible, and then one adds up their numerators. The result is called $f(n)$. For example $f(6)$ is determined by considering the fractions $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, $\frac{5}{6}$, which are reduced to $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{6}$, yielding $f(6) = 1 + 1 + 1 + 2 + 5 = 10$.

Determine whether $f(2^{1001} \cdot 1001)$ is even or odd.

Problem 4. Five squares are placed as shown in the figure.

Prove that the area of the square S is equal to the area of the triangle T.



Problem 5. A *lattice point* is a point in the plane with integer coordinates. Georg goes for a walk in the plane. He starts at $(0,0)$ and walks from lattice point to lattice point in steps of length 1 horizontally or vertically. He ends the walk in $(0,0)$ after more than two steps and has not visited any point more than once. Georg notices that there exists a lattice point P which he has not visited so that every lattice point Q along his walk satisfies that no lattice points other than P and Q lie on the line segment PQ.

Prove that 4 divides the number of steps in Georg's walk.

Sponsors: Undervisningsministeriet, Novo Nordisk Fonden, Jane Street, Jobindex, LEO Fondet, Institut for Matematiske Fag KU, Institut for Matematik og Datalogi SDU, Institut for Matematik AU, Institut for Matematiske Fag AAU, Georg Mohr Fonden and Matematiklærerforeningen.