

OLYMPIAD CORNER SOLUTIONS

Statements of the problems in this section originally appear in 2022: 48(3), p. 138–140.

OC571. The Tournament of Towns is held once per year. The 43rd such tournament took place in 2021 and, amazingly, 43 is a divisor of 2021: $2021 \div 43 = 47$. How many times more will humanity witness such a wonderful event?

Originally 2021 Tournament of Towns, Junior O-Level, Problem 1.

We received 13 submissions of which 12 were correct and complete. We present 2 solutions.

Solution 1, by the Missouri State University Problem Solving Group.

The k th tournament takes place in the year $1978 + k$, so we want

$$\frac{1978 + k}{k} = \frac{1978}{k} + 1$$

to be an integer. This means k must be a divisor of 1978, so

$$k \in \{1, 2, 23, 43, 46, 86, 989, 1978\}.$$

There are eight such occurrences in total and four more after 2021 (assuming the tournament survives long enough).