Email training, N12
December 8-14, 2019

Problem 12.1. Find the minimal possible value of the expression
$$|a - 1| + |b - 2| + |c - 3| + |3a + 2b + c|.$$

Problem 12.2. Let s is the number of divisors of positive integer n. Evaluate the product of divisors of n in terms of s and n.

Problem 12.3. Find the smallest integer n such that 2019! is not divisible by n^n.

Problem 12.4. Find the maximal possible value of the expression
$$|...||x_1 - x_2| - x_3| - x_4| - ... |-x_{1990}|,$$
where $x_1, x_2, ..., x_{1990}$ is the permutation of numbers $1, 2, 3, ..., 1990$.

Problem 12.5. The numbers $12, 1, 10, 6, 8, 3$ (in written order) are written on the verticies of regular hexagon. On each step one allowed to choose any side of the hexagon and either increase by 1 values written on the vertices of the side, either dicrease both of them by 1. Is it possible to get the following configurations?

    a) $14, 6, 13, 4, 5, 2$;
    b) $6, 17, 14, 3, 15, 3$.

Problem 12.6. Let there are n regions on the plane, part of them are red, and the rest are blue. At each step one allowed to choose a region X, such that most of it's region have different from X color and paint region X by opposite color. Prove, that this process can't be processed infinitely long time.

Solution submission deadline December 14, 2019