1 [3] Pete summed up 100 consecutive powers of two, while Basil summed up several first consecutive positive integers. Can they get the same result?

2 [4] A moth made four small holes in a square carpet with a 275 cm side. Can one always cut out a square piece with a 1 m side without holes? (Consider holes as points).

3 [5] Among $2n+1$ positive integers there is exactly one 0, while each of the numbers 1, 2, ..., $n$ is presented exactly twice. For which $n$ can one line up these numbers so that for any $m = 1, \ldots, n$ there are exactly $m$ numbers between two $m$’s?

5 [5] Points $K$ and $L$ are marked on the median $AM$ of triangle $ABC$, so that $AK = KL = LM$. Point $P$ is chosen so that triangles $KPL$ and $ABC$ are similar (the corresponding vertices are listed in the same order). Given that points $P$ and $C$ are on the same side of line $AM$, prove that point $P$ lies on line $AC$.

5 [5] 2015 positive integers are arranged in a circular order. The difference between any two adjacent numbers coincides with their greatest common divisor. Determine the maximal value of N which divides the product of the numbers, regardless of their choice.