www.artofproblemsolving.com/community/c3169370
by parmenides51

1   Writing down the first 4 rows of the Pascal triangle in the usual way and then adding up the
numbers in vertical columns, we obtain 7 numbers as shown above. If we repeat this procedure
with the first 1024 rows of the Pascal triangle, how many of the 2047 numbers thus obtained will
be odd?
`https://cdn.artofproblemsolving.com/attachments/8/a/4dc4a815d8b002c9f36a6da7ad6e1c11a848e`
`png`

2 $A_1B_1A_2$, $B_1A_2B_2$, $A_2B_2A_3$,...,$B_{13}A_{14}B_{14}$, $A_{14}B_{14}A_1$ and $B_{14}A_1B_1$ are equilateral rigid plates that
can be folded along the edges A_1B_1,B_1A_2, ..., $A_{14}B_{14}$ and $B_{14}A_1$ respectively. Can they be folded
so that all 28 plates lie in the same plane?

3   Given are n integers, not necessarily distinct, and two positive integers p and q. If the n numbers
are not all distinct, choose two equal ones. Add p to one of them and subtract q from the other.
If there are still equal ones among the n numbers, repeat this procedure. Prove that after a finite
number of steps, all n numbers are distinct.