

### Mathematical Auction.

1. A diagonal is drawn in each small square of an  $8 \times 8$  square. Look at the union of these small diagonals. It consists of a few not-connected components such that all the diagonals within each component are connected. Within a component, you can walk from point to point along the diagonal lines. Draw the diagonals in such a way that you get as many components as possible.

2. Place as many rooks as you can of a chessboard in such a way that each rook attacks an odd number of other rooks.



3. A tower of 80 coins is placed at the central square of a  $1 \times 1001$  board. During a turn, one can lift  $k$  of top coins from any tower (you can lift any number of coins, even all coins), and place them onto a square  $k$  fields to the right or to the left. If this square contains some coins already, then the relocated coins are placed on top. The goal is to relocate all coins from the original position to the square immediately right from it. Do this in as few turns as possible.

