A **The Catalan number problem.** $2n$ people stand in line to buy a cinema ticket which costs 50 cents. Half the people each have 1 dollar and the other half each have 50 cents. In how many ways can they stand in line so that the person in the ticket booth always has change (if needed) for the person in front of the window?

B How many different paths of length $N$ are there from $(0, 0)$ to $(p, q)$?