9. A trial here is buying 2 pairs of gloves. There are N customers, therefore N trials. At each trial the outcomes are:

- both pairs have the same colour
- ~~each both~~ the pairs have different colours

We have 2N pairs of gloves in total to choose from and because all gloves of the same colour are identical, we have 2N pairs of pairs to choose from(each customer can either choose 2 pairs of the same or different colour, and we have N customers therefore we have 2N pairs of pairs to choose from), out of which N have different colours and sampling is done without replacement.

This is a hypergeometric model with parameters: $\cancel{N \quad 2N} \quad N = 2 \cdot N$ ($2 \leftarrow$ ~~number~~ total number of gloves)

$$m_1 = N$$

$$m = N$$

$$\Rightarrow P(A) = P(k = N) = \frac{C_N^N \cdot C_{2N-N}^{N-N}}{C_{2N}^N}$$

$$= \frac{1 \cdot 1}{\dfrac{(2N)!}{N! \cdot N!}}$$

$$= \frac{(N!)^2}{(2N)!}$$