It is perhaps easier to consider the cards as being in a fixed order and the counting to be a randomization of the given sequence (18 ones, 17 twos, 17 threes).

The number of sequences is \( \frac{52!}{18!17!17!} = 99,579,591,790,845,629,463,000 \).

Suppose that \( i \) ones, \( j \) twos and \( k \) threes are in specified positions with the same labels (forbidden positions).

The number of such sequences is \( P (i, j, k) = \binom{4}{i} \binom{4}{j} \binom{4}{k} \frac{(52 - i - j - k)!}{(18 - i)! (17 - j)! (17 - k)!} \).

By the principle of inclusion-exclusion, the number of winning sequences is

\[
\sum_{i=0}^{4} \sum_{j=0}^{4} \sum_{k=0}^{4} \binom{4}{i} \binom{4}{j} \binom{4}{k} \frac{(52 - i - j - k)!}{(18 - i)! (17 - j)! (17 - k)!} (-1)^{i+j+k} = 813,069,712,393,655,972,160,
\]

and the probability of winning is

\[
\left( \frac{52!}{18!17!17!} \right)^{-1} \sum_{i=0}^{4} \sum_{j=0}^{4} \sum_{k=0}^{4} \binom{4}{i} \binom{4}{j} \binom{4}{k} \frac{(52 - i - j - k)!}{(18 - i)! (17 - j)! (17 - k)!} (-1)^{i+j+k} = \frac{24,532,967,512}{3,004,641,364,725} \approx 0.008165
\]