Calculating the Probability for Winning a 649 Lottery

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0.1 Introduction

This Article will demonstrate how to calculate the probability for winning a 649 lottery using Permutation and Combination.

0.2 What is Probability?

Probability is a number between 0-1 inclusively that projects or predicts the likelihood of an event occurring in this universe of ours. If the number is closer to 1 the event is more likely to take place.

0.2.1 Computing the probability of winning 649 Lottery

$$\text{The probability of winning 649} = \frac{\text{the total number of winning lottery ticket}}{\text{the total number of possible winning ticket}}$$

The total number of winning ticket = 1

The total number of possible winning ticket = choosing 6 unique numbers out of 49 numbers without repetition

$$\begin{aligned}
\text{The total number of possible winning ticket} =& \binom{49}{6} \\
=& \frac{49!}{6!(49-6)!} \\
=& \frac{49 \times 48 \times 47 \times 46 \times 45 \times 44 \times 43!}{(6 \times 5 \times 4 \times 3 \times 2 \times 1) \times 43!} \\
=& 13,983,816 \\
\approx& 14,000,000
\end{aligned}$$

$$\text{The probability of winning 649} \approx \frac{1}{14,000,000}$$

According to Google.com Canada's population was 35.85 million in year 2015. That is why I do not believe in luck. I strongly believe luck is hard work and what one makes out of his or her own life. I believe in Mathematics, Probability and Statistics. So I wish you a high probability in winning the lottery.