EXAM P QUESTIONS OF THE WEEK

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Week of June 26/06

In the Canadian national lottery called "6-49", a ticket consists of 6 distinct numbers from 1 to 49 chosen by the player. The lottery chooses 6 distinct numbers at random from 1 to 49. If a player's ticket matches at least 3 of the 6 numbers chosen at random, then the player wins a prize. The next lottery is next Wednesday. A lottery player buys the following two tickets for next Wednesday's lottery:

  Ticket 1 - 1 , 2 , 3 , 4 , 5 , 6   Ticket 2 - 7 , 8 , 9 , 10 , 11 , 12

Find the player's chance of not matching any of the 6 random numbers chosen on either of her two tickets.

The solution can be found below.

Week of June 26/06 - Solution

In order to have no matching number on either ticket, the 6 randomly chosen numbers must come from the 37 other numbers, $13, 14, \ldots, 49$. The probability in question is the ratio of the number of random ticket draws that result in the event over the total possible number of random ticket draws.

$$P(A) = \frac{\binom{37}{6}}{\binom{49}{6}} = \frac{\text{\# randomly chosen tickets that avoid 1,2,...,12}}{\text{total number of possible randomly chosen tickets}} = \frac{37!/(31!\ 6!)}{49!/(43!\ 6!)} = .166248 .$$