How to Calculate the Probabilities of Winning the Eight LUCKY MONEY Prize Levels:

LUCKY MONEY™ numbers are drawn from two sets of numbers. Four numbers are drawn from one set of 47 numbered white balls and one **LUCKY BALL®** number is drawn from a second set of 17 numbered orange balls. The odds of winning LUCKY MONEY are calculated by combining the odds for both sets of numbers for all prize levels. The first, third, fifth, sixth and eighth prize level odds are determined by the chances of choosing a given number of white balls correctly as well as the orange **LUCKY BALL**. The second, fourth and seventh prize level odds are determined by the chances of choosing a given number of white balls correctly and the orange **LUCKY BALL** incorrectly. Since the order of the items chosen is irrelevant, the applicable probability rule is the formula to determine combinations.

Before calculating the odds for the different prize levels, calculate the total number of combinations possible for each portion of the LUCKY MONEY draw.

A. Calculate how many combinations of 4 numbers can be drawn from 47 unique numbers:

   The formula is as follows:

$$\frac{47!}{4!\,(47-4)!} = \frac{47*46*45*47*43!}{4*3*2*1*43!} = \frac{47*46*45*47}{4*3*2*1} = \frac{4{,}280{,}760}{24} = 178{,}365$$

   where ! indicates a factorial, i.e., $n! = n*(n-1)*(n-2)*\ldots*2*1$

   Thus, there are 178,365 different ways in which 4 numbers can be chosen from a total of 47 unique numbers.

B. Calculate how many combinations of 1 number can be drawn from 17 unique numbers:

$$\frac{17!}{1!\,(17-1)!} = \frac{17*16!}{1*16!} = 17$$

   Thus, there are 17 different ways 1 number can be chosen from a total of 17 unique numbers.

1. **<u>Top Prize Level</u>**: ***Match all four numbers plus the LUCKY BALL*** **(***1 in 3,032,205 odds)*

Step 1: Calculate the number of ways in which 4 numbers can be chosen correctly out of 4 numbers drawn from 47 unique numbers.

The formula is as follows:

$$\frac{4!}{4!\,(4-4)!} * \frac{(47-4)!}{((47-4)-(4-4))!\,(4-4)!} = \frac{1}{0!} * \frac{43!}{(43-0)!\;0!} = \frac{43!}{43!\,1} = 1$$

(note: 0!=1)

This means that there is only 1 way in which 4 numbers out of 4 numbers drawn from a field of 47 numbers can be chosen correctly.

Thus, there is only 1 chance in 178,365 of correctly choosing all four numbers drawn in the first portion of LUCKY MONEY.

Step 2: Calculate how many ways the correct LUCKY BALL number can be chosen from 17 unique numbers.

The chance of correctly choosing the LUCKY BALL is simply 1 in 17.

Step 3: Determine the chance of choosing both correctly by multiplying these figures together:

$$\frac{1}{178{,}365} * \frac{1}{17} = \frac{1}{3{,}032{,}205}$$ or 1 chance in 3,032,205.

2. **<u>Second Prize Level</u>:** ***Match all four numbers only*** *(1 in 189,512.81 odds)*

Step 1: The chance of getting 4 numbers correct out of 4 numbers drawn from 47 unique numbers is 1 in 178,365 (see #1, Step 1 above.)

Step 2: The chance of correctly choosing the LUCKY BALL is 1 in 17. Therefore, the chances of incorrectly choosing the LUCKY BALL are, conversely, 16 in 17.

Step 3: Determine the chances of choosing 4 out of 4 of 47 correctly and getting the LUCKY BALL incorrect by multiplying these figures together:

$$\frac{1}{178{,}365} * \frac{16}{17} = \frac{16}{3{,}032{,}205} = \frac{1}{189{,}512.81}$$ or 1 chance in 189,512.81.

3. <u>Third Prize Level</u>: *Match three numbers plus the LUCKY BALL* *(1 in 17,629.10 odds)*

Step 1: Calculate the number of ways in which 3 numbers can be chosen correctly out of 4 numbers drawn from 47 unique numbers.

The formula is as follows:

$$\frac{4!}{3!\,(4-3)!} * \frac{(47-4)!}{((47-4)-(4-3))!\,(4-3)!} = \frac{4*3!}{3!\ 1!} * \frac{43!}{(43-1)!\ 1!} = \frac{4}{1} * \frac{43*42!}{42!\,1} = 4*43 = 172$$

This means that there are 172 different ways in which 3 numbers out of 4 numbers drawn from a field of 47 numbers can be chosen correctly.

Thus, the chances are 172 in 178,365 of correctly choosing 3 out of 4 numbers in the first portion of LUCKY MONEY.

Step 2: The chance of correctly choosing the LUCKY BALL is simply 1 in 17.

Step 3: Determine the chances of choosing 3 out of 4 of 47 correctly and getting the LUCKY BALL correct by multiplying these figures together:

$$\frac{172}{178{,}365} * \frac{1}{17} = \frac{172}{3{,}032{,}205} = \frac{1}{17{,}629.10}$$ or 1 chance in 17,629.10.

4. <u>Fourth Prize Level</u>: *Match three numbers only* *(1 in 1,101.82 odds)*

Step 1: The chances of getting 3 numbers correct out of 4 numbers drawn from 47 unique numbers are 172 in 178,365 (see #3, Step 1, above.)

Step 2: The chance of correctly choosing the LUCKY BALL is 1 in 17. Therefore, the chances of incorrectly choosing the LUCKY BALL are, conversely, 16 in 17.

Step 3: Determine the chances of choosing 3 out of 4 of 47 correctly and getting the LUCKY BALL incorrect by multiplying these figures together:

$$\frac{172}{178{,}365} * \frac{16}{17} = \frac{2{,}752}{3{,}032{,}205} = \frac{1}{1{,}101.82}$$ or 1 chance in 1,101.82.

5. <u>Fifth Prize Level</u>: *Match two numbers plus the LUCKY BALL* *(1 in 559.65 odds)*

Step 1: Calculate the number of ways in which 2 numbers can be chosen correctly out of 4 numbers drawn from 47 unique numbers.

The formula is as follows:

$$\frac{4!}{2!\,(4-2)!} * \frac{(47-4)!}{((47-4)-(4-2))!\,(4-2)!} = \frac{4*3*2!}{2!\ 2!} * \frac{43!}{(43-2)!\,2!} = \frac{4*3}{2} * \frac{43*42*41!}{41!\,2*1} = 3*43*42 = 5{,}418$$

This means that there are 5,418 different ways in which 2 numbers out of 4 numbers drawn from a field of 47 numbers can be chosen correctly.

Thus, the chances are 5,418 in 178,365 of correctly choosing 2 out of 4 numbers in the first portion of LUCKY MONEY.

Step 2: The chance of correctly choosing the LUCKY BALL is simply 1 in 17.

Step 3: Determine the chances of choosing 2 out of 4 of 47 correctly and getting the LUCKY BALL correct by multiplying these figures together:

$$\frac{5{,}418}{178{,}365} * \frac{1}{17} = \frac{5{,}418}{3{,}032{,}205} = \frac{1}{559.65}$$ or 1 chance in 559.65.

6. <u>Sixth Prize Level</u>: *Match one number plus the LUCKY BALL* *(1 in 61.43 odds)*

Step 1: Calculate the number of ways in which 1 number can be chosen correctly out of 4 numbers drawn from 47 unique numbers.

The formula is as follows:

$$\frac{4!}{1!\,(4-1)!} * \frac{(47-4)!}{((47-4)-(4-1))!\,(4-1)!} = \frac{4*3!}{1!\ 3!} * \frac{43!}{(43-3)!\ 3!} = \frac{4}{1} * \frac{43*42*41*40!}{40!\,3*2*1} = \frac{4*43*42*41}{6} = 49{,}364$$

This means that there are 49,364 different ways in which 1 number out of 4 numbers drawn from a field of 47 numbers can be chosen correctly.

Thus, the chances are 49,364 in 178,365 of correctly choosing 1 out of 4 numbers in the first portion of LUCKY MONEY.

Step 2: The chance of correctly choosing the LUCKY BALL is simply 1 in 17.

Step 3: Determine the chances of choosing 1 out of 4 of 47 correctly and getting the LUCKY BALL correct by multiplying these figures together:

$$\frac{49{,}364}{178{,}365} * \frac{1}{17} = \frac{49{,}364}{3{,}032{,}205} = \frac{1}{61.43}$$ or 1 chance in 61.43.

7. <u>Seventh Prize Level</u>: *Match two numbers only* *(1 in 34.98 odds)*

Step 1: The chances of getting 2 numbers correct out of 4 numbers drawn from 47 unique numbers are 5,418 in 178,365 (see #5, Step 1, above.)

Step 2: The chance of correctly choosing the LUCKY BALL is 1 in 17. Therefore, the chances of incorrectly choosing the LUCKY BALL are, conversely, 16 in 17.

Step 3: Determine the chances of choosing 2 out of 4 of 47 correctly and getting the LUCKY BALL incorrect by multiplying these figures together:

$$\frac{5{,}418}{178{,}365} * \frac{16}{17} = \frac{86{,}688}{3{,}032{,}205} = \frac{1}{34.98}$$ or 1 chance in 34.98.

8. <u>Eighth Prize Level</u>: *Match the LUCKY BALL only* *(1 in 24.57 odds)*

Step 1: Calculate the number of ways in which no numbers are chosen correctly out of 4 numbers drawn from 47 unique numbers.

The formula is as follows:

$$\frac{4!}{0!\,(4-0)!} * \frac{(47-4)!}{((47-4)-(4-0))!\,(4-0)!} = \frac{4!}{1*4!} * \frac{43!}{(43-4)!\;4!} = \frac{43*42*41*40*39!}{39!\,4*3*2*1} = \frac{43*42*41*40}{24} = 123{,}410$$

$(Note\colon\ 0! = 1)$

This means that there are 123,410 different ways in which no numbers out of 4 numbers drawn from a field of 47 numbers are chosen correctly.

Thus, the chances are 123,410 in 178,365 of correctly choosing 0 out of 4 numbers in the first portion of LUCKY MONEY

Step 2: The chance of correctly choosing the LUCKY BALL is simply 1 in 17.

Step 3: Determine the chances of choosing 0 out of 4 of 47 correctly and getting the LUCKY BALL correct by multiplying these figures together:

$$\frac{123{,}410}{178{,}365} * \frac{1}{17} = \frac{123{,}410}{3{,}032{,}205} = \frac{1}{24.57}$$ or 1 chance in 24.57.