

How to Calculate the Probabilities of Winning the Nine Cash4Life Prize Levels:

CASH4LIFE™ numbers are drawn from two sets of numbers. Five numbers are drawn from one set of 60 numbered white balls and one **CASH BALL®** number is drawn from a second set of 4 numbered green balls. The odds of winning CASH4LIFE are calculated by combining the odds for both sets of numbers for all prize levels. The first, third, fifth, seventh, and ninth prize level odds are determined by the chances of choosing a given number of white balls correctly as well as the green **CASH BALL**. The second, fourth, sixth, and eighth prize level odds are determined by the chances of choosing a given number of white balls correctly and the green **CASH 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 CASH4LIFE draw.

- A. Calculate how many combinations of 5 numbers can be drawn from 60 unique numbers:

The formula is as follows:

$$\frac{60!}{5!(60-5)!} = \frac{60 * 59 * 58 * 57 * 56 * 55!}{5 * 4 * 3 * 2 * 1 * 55!} = \frac{60 * 59 * 58 * 57 * 56}{5 * 4 * 3 * 2 * 1} = \frac{655,381,440}{120} = 5,461,512$$

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

Thus, there are 5,461,512 different ways in which 5 numbers can be chosen from a total of 60 unique numbers.

- B. Calculate how many combinations of 1 number can be drawn from 4 unique numbers:

$$\frac{4!}{1!(4-1)!} = \frac{4 * 3!}{1 * 3!} = 4$$

Thus, there are 4 different ways 1 number can be chosen from a total of 4 unique numbers.

1. Top Prize Level: Match all five numbers plus the CASH BALL (1 in 21,486,048 odds)

Step 1: Calculate the number of ways in which 5 numbers can be chosen correctly out of 5 numbers drawn from 60 unique numbers.

The formula is as follows:

$$\frac{5!}{5!(5-5)!} * \frac{(60-5)!}{((60-5)-(5-5))!(5-5)!} = \frac{1}{0!} * \frac{55!}{(55-0)! 0!} = \frac{55!}{55! 1} = 1$$

(note: 0!=1)

This means that there is only 1 way in which 5 numbers out of 5 numbers drawn from a field of 60 numbers can be chosen correctly.

Thus, there is only 1 chance in 5,461,512 of correctly choosing all five numbers drawn in the first portion of CASH4LIFE.

Step 2: Calculate how many ways the correct CASH BALL number can be chosen from 4 unique numbers.

The chance of correctly choosing the CASH BALL is simply 1 in 4.

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

$$\frac{1}{5,461,512} * \frac{1}{4} = \frac{1}{21,846,048} \text{ or 1 chance in 21,846,048.}$$

2. Second Prize Level: Match all five numbers only (1 in 7,282,016 odds)

Step 1: The chance of getting 5 numbers correct out of 5 numbers drawn from 60 unique numbers is 1 in 5,461,512 (see #1, Step 1 above.)

Step 2: The chance of correctly choosing the CASH BALL is 1 in 4. Therefore, the chances of incorrectly choosing the CASH BALL are, conversely, 3 in 4.

Step 3: Determine the chances of choosing 5 out of 5 of 60 correctly and getting the CASH BALL incorrect by multiplying these figures together:

$$\frac{1}{5,461,512} * \frac{3}{4} = \frac{3}{21,846,048} = \frac{1}{7,282,016} \text{ or 1 chance in 7,282,016.}$$

3. Third Prize Level: Match four numbers plus the CASH BALL (1 in 79,440.17 odds)

Step 1: Calculate the number of ways in which 4 numbers can be chosen correctly out of 5 numbers drawn from 60 unique numbers.

The formula is as follows:

$$\frac{5!}{4!(5-4)!} * \frac{(60-5)!}{((60-5)-(5-4))!(5-4)!} = \frac{5 * 4!}{4! 1!} * \frac{55!}{(55-1)! 1!} = \frac{5}{1} * \frac{55 * 54!}{54! 1} = 5 * 55 = 275$$

This means that there are 275 different ways in which 4 numbers out of 5 numbers drawn from a field of 60 numbers can be chosen correctly.

Thus, the chances are 275 in 5,461,512 of correctly choosing 4 out of 5 numbers in the first portion of CASH4LIFE.

Step 2: The chance of correctly choosing the CASH BALL is simply 1 in 4.

Step 3: Determine the chances of choosing 4 out of 5 of 60 correctly and getting the CASH BALL correct by multiplying these figures together:

$$\frac{275}{5,461,512} * \frac{1}{4} = \frac{275}{21,846,048} = \frac{1}{79,440.17} \text{ or 1 chance in 79,440.17.}$$

4. Fourth Prize Level: Match four numbers only (1 in 26,480.06 odds)

Step 1: The chances of getting 4 numbers correct out of 5 numbers drawn from 60 unique numbers are 275 in 5,461,512 (see #3, Step 1, above.)

Step 2: The chance of correctly choosing the CASH BALL is 1 in 4. Therefore, the chances of incorrectly choosing the CASH BALL are, conversely, 3 in 4.

Step 3: Determine the chances of choosing 4 out of 5 of 60 correctly and getting the CASH BALL incorrect by multiplying these figures together:

$$\frac{275}{5,461,512} * \frac{3}{4} = \frac{825}{21,846,048} = \frac{1}{26,480.06} \text{ or 1 chance in 26,480.06.}$$

5. Fifth Prize Level: Match three numbers plus the CASH BALL (1 in 1,471.11 odds)

Step 1: Calculate the number of ways in which 3 numbers can be chosen correctly out of 5 numbers drawn from 60 unique numbers.

The formula is as follows:

$$\frac{5!}{3!(5-3)!} * \frac{(60-5)!}{((60-5)-(5-3))!(5-3)!} = \frac{5 * 4 * 3!}{3! 2!} * \frac{55!}{(55-2)!2!} = \frac{5 * 4}{2} * \frac{55 * 54 * 53!}{53!2 * 1} = 5 * 55 * 54 = 14,850$$

This means that there are 14,850 different ways in which 3 numbers out of 5 numbers drawn from a field of 60 numbers can be chosen correctly.

Thus, the chances are 14,850 in 5,461,512 of correctly choosing 3 out of 5 numbers in the first portion of CASH4LIFE.

Step 2: The chance of correctly choosing the CASH BALL is simply 1 in 4.

Step 3: Determine the chances of choosing 3 out of 5 of 60 correctly and getting the CASH BALL correct by multiplying these figures together:

$$\frac{14,850}{5,461,512} * \frac{1}{4} = \frac{14,850}{21,846,048} = \frac{1}{1,471.11} \text{ or 1 chance in 1,471.11.}$$

6. Sixth Prize Level: Match three numbers only (1 in 490.37 odds)

Step 1: The chances of getting 3 numbers correct out of 5 numbers drawn from 60 unique numbers are 14,850 in 5,461,512 (see #5, Step 1, above.)

Step 2: The chance of correctly choosing the CASH BALL is 1 in 4. Therefore, the chances of incorrectly choosing the CASH BALL are, conversely, 3 in 4.

Step 3: Determine the chances of choosing 3 out of 5 of 60 correctly and getting the CASH BALL incorrect by multiplying these figures together:

$$\frac{14,850}{5,461,512} * \frac{3}{4} = \frac{44,550}{21,846,048} = \frac{1}{490.37} \text{ or 1 chance in 490.37.}$$

7. Seventh Prize Level: Match two numbers plus the CASH BALL (1 in 83.27 odds)

Step 1: Calculate the number of ways in which 2 numbers can be chosen correctly out of 5 numbers drawn from 60 unique numbers.

The formula is as follows:

$$\frac{5!}{2!(5-2)!} * \frac{(60-5)!}{((60-5)-(5-2))!(5-2)!} = \frac{5 * 4 * 3!}{2! 3!} * \frac{55!}{(55-3)! 3!} = \frac{5 * 4}{2 * 1} * \frac{55 * 54 * 53 * 52!}{52! 3 * 2 * 1} = \frac{5 * 55 * 54 * 53}{3} = 262,350$$

This means that there are 262,350 different ways in which 2 numbers out of 5 numbers drawn from a field of 60 numbers can be chosen correctly.

Thus, the chances are 262,350 in 5,461,512 of correctly choosing 2 out of 5 numbers in the first portion of CASH4LIFE.

Step 2: The chance of correctly choosing the CASH BALL is simply 1 in 4.

Step 3: Determine the chances of choosing 2 out of 5 of 60 correctly and getting the CASH BALL correct by multiplying these figures together:

$$\frac{262,350}{5,461,512} * \frac{1}{4} = \frac{262,350}{21,846,048} = \frac{1}{83.27} \text{ or 1 chance in 83.27.}$$

8. Eighth Prize Level: Match two numbers only (1 in 27.76 odds)

Step 1: The chances of getting 2 numbers correct out of 5 numbers drawn from 60 unique numbers are 262,350 in 5,461,512 (see #7, Step 1, above.)

Step 2: The chance of correctly choosing the CASH BALL is 1 in 4. Therefore, the chances of incorrectly choosing the CASH BALL are, conversely, 3 in 4.

Step 3: Determine the chances of choosing 2 out of 5 of 60 correctly and getting the CASH BALL incorrect by multiplying these figures together:

$$\frac{262,350}{5,461,512} * \frac{3}{4} = \frac{787,050}{21,846,048} = \frac{1}{27.76} \text{ or 1 chance in 27.76.}$$

9. Ninth Prize Level: Match one number plus the CASH BALL (1 in 12.81 odds)

Step 1: Calculate the number of ways in which 1 number can be chosen correctly out of 5 numbers drawn from 60 unique numbers.

The formula is as follows:

$$\frac{5!}{1!(5-1)!} * \frac{(60-5)!}{((60-5)-(5-1))!(5-1)!} = \frac{5 * 4!}{1! 4!} * \frac{55!}{(55-4)! 4!} = \frac{5}{1} * \frac{55 * 54 * 53 * 52 * 51!}{51! 4 * 3 * 2 * 1} = \frac{5 * 55 * 54 * 53 * 52}{24} = 1,705,275$$

This means that there are 1,705,275 different ways in which 1 number out of 5 numbers drawn from a field of 60 numbers can be chosen correctly.

Thus, the chances are 1,705,275 in 5,461,512 of correctly choosing 1 out of 5 numbers in the first portion of CASH4LIFE.

Step 2: The chance of correctly choosing the CASH BALL is simply 1 in 4.

Step 3: Determine the chances of choosing 1 out of 5 of 60 correctly and getting the CASH BALL correct by multiplying these figures together:

$$\frac{1,705,275}{5,461,512} * \frac{1}{4} = \frac{1,705,275}{21,846,048} = \frac{1}{12.81} \text{ or 1 chance in 12.81.}$$