

Zero factorial

$N!$ denotes N factorial. It is the number of ways to arrange N different objects. The number of ways to arrange N different objects is also known as the number of different objects permutations. From N different objects we can choose to arrange the first object in N ways and put it in the first place, the second object in $N - 1$ ways and put it in the second place, the k -th object in $N - (k - 1)$ ways and put it in the k -th place, the last object for the last place we can choose only in one way. To each of N arrangements of the first object there is $N - 1$ arrangements of the second. Therefore the total number of arrangements of the first and second object is $N * (N - 1)$. The number of all arrangements of N different objects is

$$N! = N * (N - 1) * (N - 2) * \dots * (N - (k - 1)) * \dots * 1 \quad (1)$$

If the number of objects to arrange is zero they can be arranged in only one way and

$$0! = 1 \quad (2)$$

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