Answer on Question#37766 – Math – Combinatorics

How many 4 digit numbers are there where repetition of digits are allowed?

Solution

By fundamental principle of Counting, if one thing can be accomplished *n1* different ways and after this a second thing can be accomplished *n2* different ways, … , and finally a *k*th thing can be accomplished in *nk* different ways, then all *k* things can be accomplished in the specified order in *n1*n2*…*nk* different ways.

In real numbers the first digit can be any of 1,2,3,4,5,6,7,8,9, so, the first digit can be chosen 9 different ways. The second digit, the third and the fourth ones are any, including 0 (each of them can be chosen 10 different ways). Therefore, in case where repetition of digits are allowed, there are 9*10*10*10=9000 4-digit numbers.

In case of sequences of symbols, not numbers, there are 10*10*10*10=10000 4-digit sequences of digits.