

How many 5 digit numbers are there if the 2 leftmost digits are odd and the digit 4 can't appear more than once in the number?

First of all, the first two digits, the leftmost digits, we can have only odd digits, so that's five options {1, 3, 5, 7, 9}. Five options for the ten thousands digit, and five possibilities for the thousands digit. That's 25 possibilities for the first two. Put that aside for a moment.

For the last three, digits can be anything, 0-9, but the number 4 can't appear more than once. Here we will construct a tree/flowchart, denoted by indentation of paragraphs here.

(1) Does the hundreds digit equal 4?

→ Yes to (1): then one possibility for hundreds, nine possibilities for the tens place, and nine possibilities for the ones place. **Total = $1*9*9 = 81$ possibilities.**

→ No to (1): nine possibilities for the hundred place. Go to question (2).

(2) Does the tens digit equal 4?

→ Yes to (2): then one possibility for tens, and nine possibilities for the ones place. **Total = $9*1*9 = 81$ possibilities.**

→ No to (2): nine possibilities for the tens place, and ten possibilities for the ones place. **Total = $9*9*10 = 810$ possibilities.**

Total possibilities for the last three digits = $81 + 81 + 810 = 972$.

Total possibilities for the first two digits = **25**.

Total possible five-digit numbers that satisfy these conditions = $25*972 = 24300$.