Problem 5

For years, telephone area codes in the United States and Canada consisted of a sequence of three digits. The first digit was an integer between 2 and 9, the second digit was either 0 or 1, and the third digit was any integer from 1 to 9. How many area codes were possible? How many area codes starting with a 4 were possible?

Solution

There are 8 integers between and including 2 and 9, there are 2 integers between and including 0 and 1, and there are 9 integers between and including 1 and 9. By the principle of counting, there are

$$8 \times 2 \times 9 = 144$$

different possible area codes. If the first digit is chosen to be 4, then there are

$$1 \times 2 \times 9 = 18$$

different possible area codes instead.