

PROBABILITY

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16.4.10 ¹The number lock of a suitcase has 4 wheels each labelled with ten digits i.e. from 0 to 9. The lock opens with a sequence of four digits with no repeats. What is the probability of a person getting the right sequence to open the suitcase?

Solution:

Let the wheels be $X = \{0, 1, 2, 3\}$ and the digits be $Y = \{0, 1, 2, \dots, 9\}$.
Possible placement of digits are,

$${}^{10}P_4 = \frac{10!}{(10-4)!} = \frac{10!}{6!} = \frac{10 \times 9 \times 8 \times 7 \times 6!}{6!} = 5040 \quad (16.4.10.1)$$

Let A be the event the correct sequence is selected So, $n(A) = 1$.

Probability of correct sequence is selected as $P(A)$,

$$P(A) = \frac{n(A)}{n(s)} = \frac{1}{5040} \quad (16.4.10.2)$$

The probability of getting the right sequence to open the suitcase is $\boxed{\frac{1}{5040}}$

¹Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)