

Answer on Question #48897 – Math – Statistics and Probability

Letters of the word messenger are arranged. Find the probability that all the 'S's are together. Also find the probability that they are never together.

Solution

There are 9 letters in the word messenger. Since 9 letters can be arranged themselves in $9!$ ways, so, total number of cases is $9!$

a. Let us regard that two S are tagged together so that we shall regard them as a single letter. Now, we have 8 letters which can be arranged in $8!$ ways. But two S which are fastened together can be arranged in $2!$ ways. Hence associating these two operations, the number of favorable cases is $8! \cdot 2!$.

The probability that all the 'S's are together is

$$P(\text{all}) = \frac{8! \cdot 2!}{9!} = \frac{2}{9}$$

b. The probability that all the 'S's are never together is complement to the first case, hence

$$P(\text{never}) = 1 - \frac{2}{9} = \frac{7}{9}$$