Problem 8

When all letters are used, how many different letter arrangements can be made from the letters

(a) Fluke?

(b) Propose?

(c) Mississippi

(d) Arrange?

Solution

The number of ways to order the letters is not simply the factorial of the word length. Since letters are repeated in some words, care must be taken to not count some permutations more than once. Divide the word length factorial by the number of ways to arrange the repeated letters separately to get the number of different letter arrangements.

Part (a)

"Fluke" has five letters and no repeated letters, so there are

$$5! = 120$$

different letter arrangements.

Part (b)

"Propose" has seven letters; there are two p's and two o's. That means there are

$$\frac{7!}{2! \times 2!} = 1260$$

different letter arrangements.

Part (c)

'Mississippi" has eleven letters; there are four i's, four s's, and two p's. That means there are

$$\frac{11!}{4! \times 4! \times 2!} = 34\,650$$

different letter arrangements.

Part (d)

"Arrange" has seven letters; there are two a's and two r's. That means there are

$$\frac{7!}{2! \times 2!} = 1260$$

different letter arrangements.