

Problem 9

A child has 12 blocks, of which 6 are black, 4 are red, 1 is white, and 1 is blue. If the child puts the blocks in a line, how many arrangements are possible?

Solution

The number of ways to order the blocks is not simply $12!$. Since some blocks are identical, care must be taken to not count some permutations more than once. Divide $12!$ by the number of ways to arrange the identical blocks separately to get the number of different possible arrangements.

$$\frac{12!}{6! \times 4! \times 1! \times 1!} = 27\,720$$