H1 (1/1 point)

In a full permutation of 8 letters A, B, C, D, E, F, G, and H, how many permutations are there where only 4 of the elements are not in their original positions?

630

630

Answer: 630

EXPLANATION

Out of 8, only 4 elements are not in their original position, and the other 4 elements stay at their original positions. This is equivalent to a derangement of 4 elements, where the count is:

$$D_4 = 4! - C(4,1)3! + C(4,2)2! - C(4,3)1! + C(4,4) = 9$$

So, the total number is:

$$C(8,4) \cdot 9 = 630$$

Check | Save | Hide Answer | *You have used 1 of 3 submissions*

H2 (1/1 point)

Place n distinct balls in m identical boxes where no box is empty. The different ways to do so is known as the Stirling numbers of the second kind S(n, m). So what does S(n, n-1) equal?

- C(n,4)
- C(n,2) ✔
- C(n,3)
- C(n,1)

EXPLANATION

We can know from the meaning of Stirling numbers of the second kind. S(n, n-1) expresses that there are n balls to be put into n-1 boxes where no box is empty, which means that there is at least one box with two balls. Since the boxes are identical, we can choose 2 out of n distinct balls. Therefore there are C(n,2) ways

Final Check | Save | Hide Answer | *You have used 1 of 2 submissions*

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