1. How many ways are there of \( k \)-coloring the squares of the above diagram if the group acting is \( e_0, e_1, e_2, e_3 \) where \( e_j \) is rotation by \( 2\pi j/4 \). Assume that instead of 28 squares there are \( 4n - 4 \).

2. How many ways are there of \( k \)-coloring the squares of the same diagram if the group acting is \( e_0, e_1, e_2, e_3, p, q, r, s \) where \( p, q, r, s \) are horizontal, vertical, diagonal reflections.

3. How many ways are there to arrange 2 M’s, 4 A’s, 5 T’s and 6 H’s under the condition that any arrangement and its reversal are to be considered the same.