

1. Let X be the set of elements, R a set of colors and G the group acting on X . Suppose $|X| = n$, $|R| = r$. Determine the number of all possible colorings if $G = \{id\}$ and if $G = S_n$.
2. Determine the number of colorings of faces of a tetrahedron with r colors.
3. Determine the number of distinct bracelets with 4 pearls (2 black, 1 green and 1 red).
4. Determine the number of distinct colorings of faces of a cube with 3 green, 2 black and 1 red face.
5. Determine the cyclic index for a group of symmetries of a tetrahedron acting on its vertices or faces.