

1. Find the “average” number of fixed points for every permutation of
  - (a)  $S_n$ ;
  - (b)  $A_n$ ;
  - (c) an arbitrary transitive permutation group.
2. Count the number of different necklaces that can be made of
  - (a) seven beads of two colors;
  - (b) eight beads of two colors;
  - (c)  $n$  beads of  $k$  colors.
3. Count the number of different colorings of the vertices of a cube with
  - (a) two colors;
  - (b)  $k$  colors.