1) Let $\varphi : G \to H$ be an isomorphism. Show that the inverse mapping $\varphi^{-1} : H \to G$ is also an isomorphism.

2) (GAP) The command `GQuotients` finds surjective homomorphisms from one group to another. Use it to find whether there is a surjective homomorphism from:
   a) $S_3 \to S_2$
   b) $S_4 \to S_3$
   c) $S_5 \to S_4$

3) (GAP) Number the corners of an octahedron and the corners of a cube. For both objects write down the permutations for some symmetries (rotations around corners, reflections) and create the group (using `Group`) generated by both. (Assign the groups to variables) Compute the size of both groups (using `Size`) and verify that both have size 48 (if not, you did not find sufficient symmetries – select more generators).
   Use `IsomorphismGroups` to find an isomorphism between both groups.