1. Solve Exercises 6 and 9-10 on page 106 of the Dummit–Foote book, proving the Jordan-Hölder Theorem.

2. Let G be a group acting on a set S containing at least two elements. Assume that G is transitive. Prove the following:

   (a) The stabilizers of any two elements are conjugate.

   (b) $\{g \in G | gx = x \ \forall x \in S\}$ is trivial, and if N is a normal subgroup of G with $N < G_x$ for some x, then N is trivial.