MATH 473
FALL 2019
HOMEWORK 19

1. Let a and b be the following permutations in S_7:
$$a = (1\ 2\ 3\ 4\ 5\ 6\ 7), \quad b = (2\ 3\ 5)(4\ 7\ 6).$$
Check that $a^7 = b^3 = e$ and $b^{-1}ab = a^2$. Then show that the group G generated by a and b has order 21.

2. Determine the conjugacy classes of the group G from problem 1.

3. Determine the character table of the group G from problem 1.

4. Let G be a group, and let H be a subgroup of G (not necessarily normal). Suppose that χ is a character of G.
   (a) Show that the restriction $\chi|_H$ is a character of H.
   (b) Prove that if $\chi|_H$ is irreducible, then χ is irreducible.