MAS 4301 – Generators/Relations

1. Let G be a group and $r, s \in G$ such that $|r| = 3$ and $|s| = 2$. The elements satisfy the relation $rs = sr^2$. Construct the subgroup generated by r and s. How many elements are in the group? Do you recognize this group?

2. Let G be a group and $r, s \in G$ such that $|r| = 4$ and $|s| = 2$. The elements satisfy the relation $rs = sr^{-1}$.
   (a) Explain why $r^2s = sr^2$.

   (b) Construct the subgroup generated by r and s. How many elements are in the group?

3. In S_4 let $\sigma = (a\ b\ c\ d)$ and $\tau = (a\ b)(c\ d)$.
   (a) Computer $\sigma\tau =$

   (b) Computer $\tau\sigma^{-1} =$

   (c) Compute $< \sigma, \tau >=$