

Lesson 16

WHY NORMAL SUBGROUPS ARE SO IMPORTANT – PRACTICE

Let $Q = \{ (), (1,2,5,6)(3,8,7,4), (1,3,5,7)(2,4,6,8), (1,4,5,8)(2,7,6,3), (1,5)(2,6)(3,7)(4,8), (1,6,5,2)(3,4,7,8), (1,7,5,3)(2,8,6,4), (1,8,5,4)(2,3,6,7) \}$ be the quaternion group.

1. If $H = \left\{ \begin{array}{c} () \\ (1,3,5,7)(2,4,6,8) \\ (1,5)(2,6)(3,7)(4,8) \\ (1,7,5,3)(2,8,6,4) \end{array} \right\}$, then find the two right cosets of H in Q .

2. If $H = \left\{ \begin{array}{c} () \\ (1,2,5,6)(3,8,7,4) \\ (1,5)(2,6)(3,7)(4,8) \\ (1,6,5,2)(3,4,7,8) \end{array} \right\}$, then find the two right cosets of H in Q .

3. If $H = \left\{ \begin{array}{c} () \\ (1,4,5,8)(2,7,6,3) \\ (1,5)(2,6)(3,7)(4,8) \\ (1,8,5,4)(2,3,6,7) \end{array} \right\}$, then find the two right cosets of H in Q .

4. Construct a multiplication table for the quotient group found in the previous problem.