Quiz 2

1. What is the definition of the permuation group S_n?
   The permuation group S_n is the set of all bijective mappings from the set $\{1, \ldots, n\}$ to itself, with the binary operation of composition.

2. In the permutation group S_9, write the permutation

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 6 & 2 & 7 & 3 & 1 & 5 & 9 & 8 & 4 \end{pmatrix}$$

   as a product of disjoint cycles. Then determine its order and its sign.
   (165)(3794). The order is the lcm of the orders of the cycles, which is 12. The first permuation is even and the second is odd, so the sign of the result is odd.

3. In the permutation group S_9, write the permuation (4983)(78421) as a product of disjoint cycles. Then determine its order and sign.
   (17342)(98). The order is 10 and the sign is odd.