Preparation for the Quiz

Examples of True/False questions:

A group may have more than one identity element.
Any two groups with three elements are isomorphic.
Every finite group of at most three elements is abelian.
The associative law holds in every group.
Every group is a subgroup of itself.
In every cyclic group, every non-identity element is a generator.
A subgroup of a group may be defined as a subset of the group.
\( \mathbb{Z}_4 \) is a cyclic group.
\( S_4 \) is an abelian group.
\( D_3 \) is a cyclic group.
Every cyclic group is abelian.
Every abelian group is cyclic.
All generators of \( \mathbb{Z}_{20} \) are prime numbers.
Every subgroup of an abelian group is abelian.
The symmetric group \( S_3 \) is cyclic.

Review definitions of:

Definition of a group.
Definition of a subgroup.
Definition of a permutation, cyclic permutation, and transposition.
Definition of two integers being relatively prime.
Definition of the group \( U(n) \) (= set of the positive integers which are strictly less than \( n \) and are relatively prime to \( n \) under multiplication).
Order of an element in a group.
Definition of a cyclic group.
Be able to state the Fundamental Theorem of Cyclic Group
Definition of the parity of a permutation. Definition of a cycle.
Definition of a centralizer of an element; center of a group.

Be able to compute the inverse of an element in the group \( U(n) \) using the Euclidean algorithm.
Be able to compute the order of an element of a specific group.
Be able to find the inverse of a 2 by 2 matrix with coefficients from \( \mathbb{Z}_p \) where \( p \) is a prime number.
Be able to decompose a permutation as a product of disjoint cycles. Be able to write a permutation as a product of transpositions.
Be able to find all the generators of a cyclic group, such as \( \mathbb{Z}_n \).
Be able to find the order of a permutation.
Be able to fill in entries in a group or Cayley table.

Be able to find the centralizer of an element; center of a group.