MAS 4301 –

1. Every subgroup of a cyclic group is cyclic.
2. Every subgroup of an abelian group is abelian.
3. If every proper subgroup of G is cyclic, then G is abelian.
4. Every group of order p (prime) is cyclic.
5. Every group of order p^2 (prime) is cyclic.
6. For a group G and $a, b \in G$, $(ab)^{-1} = a^{-1}b^{-1}$.
7. In S_4, the order of $(1\ 2\ 3) \circ (2\ 3)$ is 6.
8. The group of rational numbers $(Q, +, 0)$ is cyclic.
9. The groups D_3 and S_3 are isomorphic.
10. If G is finite and cyclic, and d divides the order of G, then there is a unique subgroup of G of order d.
11. In S_5, the element $(1\ 2) \circ (1\ 3) \circ (1\ 2\ 4)$ is an even permutation.
12. In Q_8, the elements i and j are conjugate.
13. If G is a finite group and $H \leq G$, then $|H|$ divides $|G|$.
14. If G is a finite group and p divides $|G|$, then G has an element of order p.
15. If G is a finite group and d divides the order of G, then G has a subgroup of order d.
16. If G is a group and $g \in G$, then $|g| = 2$ if and only if $g = g^{-1}$.
17. Every cyclic group is finite.
18. Let p and q be distinct primes. Then, every group of order pq is cyclic. If no, what about abelian?
19. Given a group G, the subset of elements of finite order is a subgroup of G.
20. If $\sigma \in S_n$ is a k-cycle and $\tau \in S_n$ is a j-cycle, then $|\sigma \circ \tau| = \mathrm{lcm}(j, k)$.
21. Suppose G is an abelian group and $g, h \in G$. Then $|gh| = \mathrm{lcm}(|g|, |h|)$.
22. Suppose G is a group and $g \in G$ has order n. Then $|g^k| = \dfrac{n}{\gcd(k, n)}$.
23. If G and H are cyclic groups, then $G \cong H$.
24. The kernel of a group homomorphism is a normal subgroup.
25. If $|G| = |H|$, then $G \cong H$.