

Review for Quiz

The quiz will take place on **Oct. 28, Monday, 9:00-10:20 am** at classroom **1104**. The following is a list of requirements.

Section 1. n -th root of unity, U_n (page 18) , **Section 2.** Binary operation (Definition 2.1). **Section 4.** Group (Definition 4.1). Abelian group (Definition 4.3). Cancellation laws (Theorem 4.15). **Section 5.** Subgroup (Definition 5.4). Theorem 5.14. Theorem 5.17. Cyclic subgroup of G generated by a (Definition 5.18). Generator (Definition 5.19).
Section 6. Cyclic group (page 59). Order of a (page 59). Theorem 6.1. Division algorithm for \mathbb{Z} . Theorem 6.6.

Section 8. Permutation (Definition 8.3). Permutation multiplication (page 76). Theorem 8.5. Symmetric group on n letters S_n (Definition 8.6).
Section 9. Orbit (Example 9.3). Cycle (Definition 9.6). Theorem 9.8. Transposition (Definition 9.11). Corollary 9.12. Theorem 9.15. Even permutation and odd permutation (Definition 9.18). Alternating group A_n (Definition 9.21). **Section 10.** Left coset and right coset (Definition 10.2). Theorem of Lagrange (Theorem 10.10). Theorem 10.12. **Section 11.** Cartesian product of sets S_1, S_2, \dots, S_n (Definition 11.1). Direct product of groups G_1, G_2, \dots, G_n (Theorem 11.2).

Important Examples of Groups

Additive groups: $\mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$. Multiplicative groups: $\mathbb{Q}^*, \mathbb{R}^*, \mathbb{C}^*, U_n$.
General linear group: $GL(n, \mathbb{R})$ (page 40). \mathbb{Z}_n, S_n, A_n .