현대대수학I **2022-1학기 수학과 졸업시험**

Spring 2022 GRADUATION EXAM Modern Algebra I

In the following problems, you must show your work, to get a full credit.

Problem 1 Prove or disprove: if H is a subgroup G of index 2, then H is normal in G.

Problem 2 Let $\varphi : G \to H$ be a group homomorphism. Then prove or disprove that the kernel of φ is a normal subgroup of G.

Problem 3 Show that there does not exist an injective group homomorphism from D_{14} to S_6.