

현대대수학 졸업시험 2016.11.7

1. Let H be a subgroup of a group G such that $[G:H]=2$.

Prove that H is a normal subgroup of G .

2. Let P be an ideal of a commutative ring R with identity.

Prove that P is a maximal ideal of R if and only if R/P is a field.

3. Does there exist a field with 6 elements? Verify your answer.