

ASSIGNMENT 2
DUE THURSDAY JANUARY 26

- (1) Let K be a finite extension of \mathbb{Q} . Prove that there are only finitely many roots of unity in K .
- (2) Describe the splitting fields over \mathbb{Q} of the following polynomials. Also find the degrees of these splitting fields.
 - (a) $x^4 - 2$
 - (b) $x^4 - 4$
 - (c) $x^5 - 7$
- (3) Let K be a field of characteristic p . Let L be an extension of K . Assume that p does not divide $[L : K]$. Show that L is a separable extension.