Algebra 4 (2003-04) – Assignment 10

Instructor: Dr. Eyal Goren

Submit by Monday, March 29, 12:00.

1) Read carefully Exe. 18, Section 13.2 (p. 530) and Exe. 8, Section 14.1 (p. 567) of Dummit and Foote. Do Exercises 29 and 30, Section 14.2 (p. 585).

2) Let K be the splitting field over $\mathbb{Q}$ of the polynomial $x^{11} - 2$. Recall that $K/\mathbb{Q}$ is Galois and that $\mathrm{Gal}(K/\mathbb{Q}) \cong \mathbb{Z}/11\mathbb{Z} \rtimes (\mathbb{Z}/11\mathbb{Z})^{\times}$. For every subgroup of G determine its fixed field K^G, writing it as $K^G = \mathbb{Q}(\alpha, \beta, \cdots)$ and finding the minimal polynomials of $\alpha, \beta, \cdots$.