

Exercises

Exercise 9.1. Show that if f_1 and f_2 are linearly independent irreducible homogeneous polynomials then f_1, f_2 is a regular sequence. Conclude that we can take $B(d_1, d_2) = 2$.

Exercise 9.2. A priori, the bound $B(d_1, \dots, d_r)$ also depends on the field k . Show that it is in fact independent of k , at least if we work in characteristic 0. [Hint: consider the graded ultraproduct of rings $k_i[x_1, x_2, \dots]$ for varying fields k_i . Show that this is a polynomial ring, and then carry out our same arguments.]