

18.701 Problem Set 7 (corrected)

This assignment is due Wednesday October 30.

1. Determine the class equation of $GL_3(\mathbb{F}_2)$, the group of invertible 3×3 matrices with entries modulo 2.

Of course, you need to determine the order of the group first. I suggest basing your analysis on the possible characteristic polynomials. There are four of them. Begin by finding nice matrices for each characteristic polynomial, but remember that the characteristic polynomial may not determine the conjugacy class.

Note that the centralizer of a matrix A is equal to the centralizer of $I + A$. This can be used in the analysis of the matrices whose characteristic polynomials are $t^3 + t^2 + 1$ or $t^3 + t + 1$, which are more complicated than the others.

2. Chapter 6, Exercise M.4. (*the hypercube*)
3. Chapter 7, Exercise 5.12. (*the class equations of S_6 and A_6*)