

Instructions: Complete the following exercises.

Solutions must be hand-written and submitted in-person.

You will be graded on clarity and simplicity as well as correctness.

You may use any resources and work with other students, but you must write up your own solutions.

Due on **Tuesday, March 31**.

For the textbook problems, numbers refer to the online version of the book posted on the course website.

1. Problem 5.16.1 in the textbook of Etingof et al.
2. Problem 5.16.2 in the textbook of Etingof et al.
3. Problem 5.16.3 in the textbook of Etingof et al.
4. Problem 5.24.1(a) in the textbook of Etingof et al.
5. Problem 5.24.1(b) in the textbook of Etingof et al.
6. Read Section 5.25 in the textbook of Etingof et al. Then determine the character table of $\mathrm{GL}_2(\mathbb{F}_3)$.

Give explicit representatives for each conjugacy class and describe the (complex) representations that give rise to each irreducible character. Clearly indicate how the rows and columns of your character table are labeled. You do not need to prove that your answer is correct.