Representation theory, Homework Set 5

Due Wednesday, December 2, 2026 at 11:59pm. But because people have presentations, everyone is eligible for a one week extension until Wednesday, December 9 at 11:59pm, without asking.

Those who have presentations in December should do the homework before then. I've given you several weeks for this homework to give you flexibility to manage your time.

We have already finished the material needed for Q1 and Q2, and will finish the rest by Nov 19 (or maybe Nov 17).

Q1 (4 marks): Exercise 8.3. You can make use of the paragraph before Example 8.3.8 in the text (which I also mentioned in class) without proof.

Q2 (4 marks): Exercise 8.8.1. (Not part 2.)

Q3 (4 marks): Exercise 9.1. (Not part 1. But you can use part 1 for part 2.)

Q4 (5 marks): Let G be a non-abelian group of order 99. Determine the number of conjugacy classes of G and the degree of each irreducible representation. Also determine the size of the commutator subgroup $[G, G]$.

Other recommended questions, not for handing in: Exercises 8.7, 8.8 (part 2), 8.10, 9.1 (part 1) and 9.2.