

Modern Algebra I, Spring 2017

Homework 10, due Wednesday April 5 before class.

Read Gallagher §15 (Splitting, duality and basic theorems for finite abelian groups) and (optional reading) Judson Section 13.1. Judson derives classification theorem (Theorem 13.4 in the latest edition) from Lemma 13.9, which is the crucial step of the proof, avoiding character theory.

Do exercises 4 and 5 in Gallagher §15 (label them as $G4$ and $G5$ in your solutions).

1. List all isomorphism classes of abelian groups of order (a) 16, (b) 27, (c) 10, (d) 40, (e) 100, (f) 49.
2. (10 points) Give an example of a natural number $n > 30$ such that there is only one isomorphism class of abelian groups of order n and only one isomorphism class of abelian groups of order $n + 1$. Justify your answer.