

A sketch of the proof of the Fundamental Theorem of Finitely Generated Abelian Groups

In class and through the exercises, we will work through the proof sketch outlined on pages 196-198 in the book. The remaining exercises are review exercises from Chapter 5.

Exercises

Exercise 1. Prove items (a), (b), (c) on page 197.

Exercise 2. Let G be a finite abelian group with invariant factors (n_1, n_2, \dots, n_t) . Show 5.3.5 that G contains an element of order m if and only if $m \mid n_1$.

Exercise 3. For subsets A and B of a group G , define $[A, B] = \langle [a, b] \mid a \in A, b \in B \rangle$. Prove 5.4.2 that a subgroup H of G is normal if and only if $[G, H] \leq H$.
