

CS 593/MA 592 - Intro to Quantum Computation

Homework 5

Due Monday, March 4 at 8pm (upload to Brightspace)

1. Do Exercise 4.50 in Nielsen and Chuang.
2. Do Problem 4.1 at the end of chapter 4 of Nielsen and Chuang. (Don't confuse with Exercise 4.1 at the beginning of the chapter!)
3. Show that if A is a finite abelian group, then the dual group $\hat{A} \cong A$. [Hint: do it in two steps. First, use the fact that every finite abelian group A is a direct sum of cyclic groups to reduce to the case that $A = \mathbb{Z}/N\mathbb{Z}$. Then argue however you want that $\widehat{\mathbb{Z}/N\mathbb{Z}}$ is a cyclic group of order N .]
4. Do Exercise 5.6 out of the book.
5. Do Exercise 5.8.