Notes for B7—Symmetry

A summary of important and more subtle points

Contents

Some of the more mathematical issues in this course are rather hard to verbalise in supervisions. I have therefore compiled this set of notes to go over these issues more carefully. I hope that this will provide you with a more satisfactory and rigorous account of the group and representation theory encountered in this course. The main purpose of these notes is to enhance your understanding and help you become more familiar and comfortable with the mathematical arguments and techniques involved in group and representation theory, thereby allowing you to develop a sensible appreciation for the use of symmetry in understanding the beauty of the quantum world.

1 Preliminaries

We introduce several mathematical preliminaries in this Section to prepare for a more rigorous treatment in what will follow.

1.1 Maps

Definition 1.1. Let X and Y be sets.