Preface

This book is intended to be the basis of a one-semester introductory course in Maple. Most introductions to Maple have the aim of showing how the system can be used to apply the mathematics the user knows. But more and more Maple is being used as a tool in the teaching and learning of mathematical concepts. In this book mathematical concepts and the corresponding Maple command are explained together. Only a passing familiarity with the basics of calculus is assumed and it is hoped the exercises within will solidly ground the concepts. In the later chapters some more advanced commands the student may need are introduced with little mathematical introduction.

Maple, along with other symbolic algebra systems, is in a position similar to that of calculators twenty odd years ago. Just as there was then debate around the issue of whether students would become incapable of multiplying and dividing, there is now concern that students will be able to use a computer to do most of a typical homework sheet without understanding the concepts behind it. This book takes the view that the use of Maple on a maths course necessitates a change in the type of exercises given. Some recent editions of textbooks, like Thomas' Calculus, have taken account of this and include special computer algebra exercises. A course in Maple should not be isolated from the material the student is learning in other courses. The assignments in other subjects should make use of the extra capabilities students have acquired through Maple. Alternatively Maple can be used as the basis for a course in experimental mathematics. This new branch of mathematics is readily accessible to first years and it is here that the new possibilities for mathematical exploration opened up by computers comes to the fore.

A novel feature of this book is the numerous Maple sessions. These show Maple being used interactively to attack a problem. False starts and commandlines which failed to work as expected are all shown. This is not a manual intended to overawe the user with the superior capabilities of machine intelligence. Results need to be critically examined and tested on simple examples. At certain points pen and paper are the quickest way to proceed.

This book is limited to the basic capabilities of Maple. In particular it does not cover:

- Maple programming. This will be covered by the second volume in this series.
- The many packages that are available for specialised areas of maths.
- Details of the interface, the versions for different platforms, Maplets (introduced in version 8), presentation capabilities of worksheets, and interaction with other software.

It is best to work through this book with Maple up and running on a computer close by. The commands in this book were executed using Maple 7 on a Microsoft Windows operating system. Version 8 has been released in the meantime. No substantial changes have been made in the basic commands, but some numerical results differ in the last decimal place. The major changes since Maple 5 Release 3 in 1994 have been mainly in the graphics capabilities, advanced maths features and interaction with other software.

Aiden O'Reilly
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