

Chapter 1

Introduction to MATLAB

This book is an introduction to two subjects, MATLAB and numerical computing. This first chapter introduces MATLAB by presenting several programs that investigate elementary, but interesting, mathematical problems. If you already have some experience programming in another language, we hope that you can see how MATLAB works by simply studying these programs.

If you want a more comprehensive introduction, an on-line manual from The MathWorks is available. Select Help in the toolbar atop the MATLAB command window, then select MATLAB Help and Getting Started. A PDF version is available under Printable versions. The document is also available from The MathWorks Web site [10]. Many other manuals produced by The MathWorks are available on line and from the Web site.

A list of over 600 MATLAB based books by other authors and publishers, in several languages, is available at [11]. Three introductions to MATLAB are of particular interest here, a relatively short primer by Sigmon and Davis [8], a medium-sized, mathematically oriented text by Higham and Higham [3], and a large, comprehensive manual by Hanselman and Littlefield [2].

You should have a copy of MATLAB close at hand so you can run our sample programs as you read about them. All of the programs used in this book have been collected in a directory (or folder) named

NCM

(The directory name is the initials of the book title.) You can either start MATLAB in this directory, or use

```
pathtool
```

to add the directory to the MATLAB path.

1.1 The Golden Ratio

What is the world's most interesting number? Perhaps you like π , or e , or 17. Some people might vote for ϕ , the *golden ratio*, computed here by our first MATLAB