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Doing Mathematics

Welcome to Version 6!

Scientific WorkPlace and *Scientific Notebook* provide easy, direct access to mathematics with a free-form interface to a computer algebra system that is integrated with a scientific word processor.

By providing an interface with little or no learning cost, *Scientific WorkPlace* and *Scientific Notebook* make symbolic computation as accessible as any word processor. For the user familiar with MuPAD, they also allow access to the full range of MuPAD functions and to functions programmed in MuPAD.

These programs are designed to fit the needs of a wide range of users, from the beginning student looking to understand and enjoy mathematics to the professional scientist who wants to produce typeset-quality documents with embedded advanced mathematical calculations and plots.

Use Natural Mathematics Notation

The essential components of this interface are *free-form editing* and *natural mathematical notation*.

The text editors in *Scientific WorkPlace* and *Scientific Notebook* accept mathematical formulas and equations entered in natural notation. The symbolic computation system produces mathematical output inside the document that is formatted in natural notation, can be edited, and can be used directly as input to subsequent mathematical calculations.

The computational engine provided with *Scientific WorkPlace* and *Scientific Notebook* version 6 is MuPAD 5. See ”[MuPAD Functions and Expressions](#) ” for a list of built-in functions and constants, descriptions of Compute menu commands in terms of the native commands of MuPAD, and descriptions of built-in functions in terms of the MuPAD syntax.

The Computational Engine

Although there are substantial changes to *Scientific WorkPlace* and *Scientific Notebook* for Version 6, the computational behavior of the program is largely unchanged. The Compute menu will look very familiar to experienced users. One new item on the Compute menu, Passthru Code to Engine, provides a way for users familiar with MuPAD syntax to pass MuPAD code directly to the MuPAD engine.

Menus in Version 6

There are some logical changes in the structure of other menus. Mathematics objects on earlier Insert menus have been gathered together under the heading Math objects, a new item on the Insert menu.

Symbol panels are available in a sidebar as well as on a Symbol toolbar.

New in Version 6

- [MuPAD 5 computer algebra system](#)
- [Rewrite fraction as mixed number and arithmetic with mixed numbers](#)
- [Choice of letters and fonts for imaginary unit and exponential e](#)
- [Overbar for complex conjugate](#)
- [More control over thresholds for scientific notation](#)
- [Decorated characters as expression names](#)
- [Passthru Code to Engine](#)

-
- Reorient 3D Plots with click and drag
 - Interactive plot tools in document window
 - Smoother 2D Plots
 - Dot notation for derivatives
 - Specify center of a power series
 - Specify both dependent and independent variables for implicit differentiation
 - Map a function to a matrix

You can begin computing as soon as you have opened a file.

1.1 Example for New Users

To type and evaluate an expression

1. Place the insert point where you want the expression and choose Insert \rightarrow Math.
2. Type a mathematical expression—for example, $2 + 2$. (It will appear red in the document window.)
3. Choose Compute \rightarrow Evaluate.

The expression $2 + 2$ will be replaced by the evaluation $2 + 2 = 4$.

1.2 Help Files

Help Files The Help files for *Doing Mathematics* give a brief explanation, with examples, of each of the basic computational features of *Scientific WorkPlace* and *Scientific Notebook*. You are encouraged to open a new document and work the examples as you proceed.

The Help files are organized around standard topics in mathematics. The first four chapters introduce basic procedures for using the system and cover the content of standard precalculus courses. Chapters five and six

give information about working with functions and creating plots. These and later chapters cover topics in analytic geometry and calculus, linear algebra, vector analysis, differential equations, statistics, and applied modern algebra. Four appendices summarize compute commands, give shortcuts for compute commands and symbols, and provide information on customizing your system for computing,

1.3 Conventions

Program tools are available from menus, toolbar buttons, and keyboard shortcuts. Many tools may be invoked in multiple ways to suit your style of work—via menus, toolbar buttons, or the keyboard. In this manual, we generally indicate only one of the possible ways of accessing a tool, usually via the menus. For command shortcuts for doing or entering mathematics, see one of [Entering Mathematics and Text](#) , [Entering Mathematical Objects](#) , [Entering Symbols and Characters](#) , or [Entering Units of Measure](#) .

Understanding the notation and the terms used in our documentation will help you understand the instructions. We assume you're familiar with the basic procedures and terminology for your operating system. In our manuals, we use the notation and terms listed below.

1.3.1 General Notation

- Text like indicates text you should type exactly as it is shown.
- Text like *this* indicates information that you must supply, such as a filename.
- Text like *this* indicates an expression that is typed in mathematics mode.
- The word *choose* means to designate a command for the program to carry out. As with all standard applications, you can choose a command with the mouse or with the keyboard. Commands may be listed on a menu or shown on a button or in a dialog box. For example, the instruction "Choose File → Open means you should first choose

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/148112031056006120>