MATHCAD HELP

General Instructions

The electronic version of *Marks' Standard Handbook for Mechanical Engineers* contains the entire contents of the printed product plus many inteactive equations. The interactive math component uses Mathcad electoronic files which can be accessed directly from within the text. You can activate the associated Mathcad file by clicking on the symbol.

marks3.ico

Navigation

Control buttons on the Mathcad Handbook toolbar perform the following actions in order from left to right:

Go to Table of Contents
Go to Index
Go to Previous Section
Go to Next Section
Go Back to Last Visited Section
Go to Previous Page
Go to Next Page
Search Book: brings up text index dialog box.

(NOTE: The buttons shown reflect the controls used in Mathcad Engine 5.0. If you are using a newer version, consult the Help files from Mathcad's menu options.)

The Scratchpad

To use the Mathcad Scratchpad to create your own calculations or to modify those supplied:

- Choose Mathcad Scratchpad from the Books menu,

  or

  Click on the Scratchpad icon then copy and paste material from a document or begin creating your own.

- Copy supplied material by drag-selecting regions in any open Mathcad document, then choose Copy from the Edit menu.
- Click anywhere on the Scratchpad window and choose Paste from the Edit menu.

NOTE: You cannot save or print any of the information placed in the scratchpad. This information is lost when you end your current session or close the Scratchpad window.

- If you need to save comments or wish to change the values used when a Mathcad document is first loaded you should use the Annotation feature described below.

Making and Saving Notes

The Mathcad Engine will allow you to save an edited form of any document you wish.

- To add mathematical expression to an Electronic Book section, simply place the cursor on any white space on the page and begin typing.
- If you are adding text, place the cursor on any white space on the page, then choose Create Text Region from the Text menu,

  or

  Click on the Text button on the toolbar, then begin typing. All of your edits are conveniently displayed in an alternate color to signify that the information has been changed.

- To save your edits choose Save Edited Section from the Books menu. Mathcad Engine will display your edited section each time you call up the document that contains it. This feature may also be used to define your own functions and formulas or create your own graphs.

Printing

You can print any section of the electronic book exactly as it appears on the screen, including any personal notes you have made. To print,

- Select Print Section (Books menu).
- If you want to preview the page before printing select Print Preview (Books menu).
- Remember that you will not be able to print the contents in the Mathcad Scratchpad window. Consult your Microsoft® documentation for additional information regarding printing and printers.

Quick Reference

Changing preset values

The values assigned to variables in the Mathcad files provided are sample data only, you will want to use values from your own calculations. To change the assigned values:

- Click on the number you want to change.
- Backspace over the number to delete it.
- Enter your own number.

Creating graphs

To create a graph of your results you must enter:

- The **X** and **Y** columns of data.
- The interval (**I**)

You then create the graph as follows:

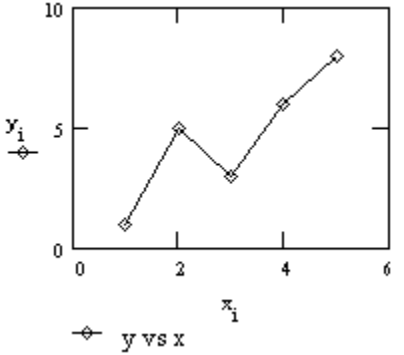
$I := 1\ldots5$

$y_i :=$

$x_i := i$

1
5
3
6
8

To create a graph of the data shown, type:
y[i@x[i



To format the graph (line color, symbol types, line graph, bar graph, etc…), double click on the graph and edit the Format dialog box that pops up.

For further information, please refer to the Mathcad on-line help, choose Index (from the Help menu).

List of Operators

The following list of operators can be reached either from the palette buttons on the left side of the screen, or from the keyboard, as shown below:

Operator	***Appearance***	***How to type***
Parentheses	$(\boldsymbol{X})$	‘(*apostrophe*) or ()
Vector subscript	v_n	[(*left bracket*)
Matrix subscript	$A_{m,n}$	[(*left bracket*)
Column subscript	$\mathbf{A}^{<n>}$	[Ctrl] 6
Vectorize	$\vec{X}$	[Ctrl] -
Factorial	$n!$	! (*exclamation point*)
Complex conjugate	$\overline{X}$	“ (*double quote*)
Transpose	$\mathbf{A}^{\mathrm{T}}$	[Ctrl] 1
Power	z^{w}	^ (*caret*)
Navigation	$-X$	- (*minus*)
Vector sum	$\sum v$	[Ctrl] 4
Square root	$\sqrt{z}$	\ (*backslash*)
Absolute value	$\lvert z \rvert$	| (*vertical bar*)
Determinant	$\lvert \mathbf{M} \rvert$	| (*vertical bar*)
Magnitude	$\lvert\ \mathbf{n}\ \rvert$	| (*vertical bar*)
Division	$\frac{X}{z}$	/ (*slash*)
Multiplication	$X.Y$	* (*asterisk*)
Cross product	$\mathbf{u} \times \mathbf{v}$	[Ctrl] 8
Summation	$\sum_{i=m}^{n} X$	[Ctrl][Shift][:]4
Product	$\prod_{i=m}^{n} X$	[Ctrl] [Shift]3

Integral	$\int_x^y f(t)dt$	& (*ampersand*)
Indefinite Integral	$\int f(t)dt$	[Ctrl]I
Derivative	$\frac{d}{dt} f(t)$	? (*question mark*)
n^{th} Derivative	$\frac{d^n}{dt^n} f(t)$	[Ctrl]?
Addition	$\boldsymbol{X} + \boldsymbol{Y}$	+ (*plus*)
Subtraction	$\boldsymbol{X} - \boldsymbol{Y}$	- (*minus*)
Greater than or equal	$x \geq y$	[Ctrl]0
Less than or equal	$x \leq y$	[Ctrl]9
Not equal to	$z \neq w$	[Ctrl]3
Equal to	$z = w$	[Ctrl]=