

# A Guide to the HP38G

## Math Menu and Programming

### Acknowledgments:

Thanks to Charles Patton of the design team of the HP38G for his help, both by sharing an advance copy of the MATH menu specifications, and by providing answers to many of my questions regarding syntax and usage. Also, many thanks to Mark Howell, Sam Gough, and Jill Lovorn for sharing their programs and expertise.

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### Introduction

This is reference material in addition to that found in the Quick Guide for the HP38G.

It includes a listing of all the different functions, commands, and constants available on the HP38G, along with some hints on programming.

The MATH key provides the access to the catalogs for all the functions and commands available that don't appear directly on the keyboard. When you press MATH, you'll see the following menu labels along the bottom of the screen:

**MTH**                      **CMDS**                      **CONS**                      **CANCL**                      **OK**

The first three of these labels each activate a different "double" menu.

The currently active menu is indicated by a little white square lit up on one of these three labels and also by a title bar you see at the top of the menu.

**MTH** activates the menu titled

MATH FUNCTIONS

**CMDS** activates the menu titled

PROGRAM COMMANDS

**CONS** activates the menu titled

PROGRAM CONSTANTS

## Notes on Terminology and Conventions

### What's the difference between a Function and a Command?

A Function always takes zero or more arguments and then returns exactly one result. For example, RAND takes no arguments and returns a random number between 0 and 1. COMB takes two arguments m and n and returns the number of combinations of n items that can be chosen from m objects:  $COMB(m,n) = m!/(n!(m-n)!)$ . Functions can be used in any expression.

A Command also takes zero or more arguments, but it does not return a result. Instead, a command may affect the value of a variable (STO > is a good example) or it may perform some specific action (BEEP is an example). Commands are used in programs, but you can also execute them from the HOME screen.

For each function and command, the syntax is given showing the required punctuation (parentheses, commas, semicolons, etc.) and the order of any needed arguments. Some specific types of arguments are indicated as follows:

<name>	a variable name
<expr>	any expression
< N#>	a positive integer or expression that has a positive integer value
<R#>	a real number or expression that has a real numeric value
<C#>	a complex number or expression that has a complex value
<#>	a real or complex number or expression
< { } >	a list or an expression that has a list value
<M#>	a matrix or an expression that has a matrix value
<V#>	a vector or an expression that has a vector value

Other more descriptive abbreviations are sometimes used.

In this reference material you will find the following information provided for each math function or programming command:

Name	Syntax of usage (showing type and order of arguments)			
FCN or CMD	FCN(<arg1>, <arg2> ...) or CMD < arg1 >; < arg2 >; ...			
	<table style="border: none; margin: auto;"> <tr> <td style="padding-right: 20px;"><i>Description of Arguments</i></td> <td style="text-align: center;">-----&gt;</td> <td style="padding-left: 20px;"><i>Description of Result or Action</i></td> </tr> </table>	<i>Description of Arguments</i>	----->	<i>Description of Result or Action</i>
<i>Description of Arguments</i>	----->	<i>Description of Result or Action</i>		

Additional notes of explanation are also provided as needed.

### HELPWITH

If you type HELPWITH FCN or HELPWITH CMD on the HOME screen (where FCN or CMD is a specific function name or programming command) a box comes up which shows the syntax needed.