



# **Reference Guide for the TI-84 Plus CE Graphing Calculator**

**Catalog, Commands and Functions, Error Messages  
Arithmetic Operations, Test Relations, and Symbols**

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# What's New

## *What's New in the TI-84 Plus CE Reference Guide:*

The updates reflect new and updated commands for TI Basic Programming and TI-Innovator™ Hub.

All items listed are new or updated entries in the Reference Guide for the TI-84 Plus CE Graphing Calculator.

- E
  - [eval\(\)](#)
  - [expr\(\)](#)
- G
  - [Get\(\)](#)
- I
  - [invBinom\(\)](#)
  - [invNorm\(\)](#)
  - [invNormTails](#)
- P
  - [Pause](#)
- S
  - [Send\(\)](#)
  - [SEQ Type](#)
  - [String>Equ\(\)](#)
- T
  - [toString\(\)](#)
- W
  - [Wait](#)

# Introduction

In this Reference Guide you will find the following information:

- [CATALOG, Strings, Hyperbolic Functions](#) - Includes instructions on browsing, using, entering strings, and other functions in the CATALOG.
- [Commands and Functions Listing](#) - Includes an [alphabetical listing](#) of all CATALOG items, referencing:
  - Function or Instruction/Arguments
  - Results
  - Key or Keys/Menu or Screen/Item
- [Arithmetic Operations, Test Relations, and Symbols](#) - Items whose names are not alphabetic (such as +, !, and >).
- [Error Messages](#) - Includes a listing of error types with possible causes and suggested remedies.

# CATALOG, Strings, Hyperbolic Functions

## *What Is the CATALOG?*

The CATALOG is an alphabetical list of all functions and instructions on the TI-84 Plus CE. You also can access each CATALOG item from a menu or the keyboard, except:

- The six string functions
- The six hyperbolic functions
- The **solve(** instruction without the equation solver editor
- The inferential stat functions without the inferential stat editors

**Note:** The only CATALOG programming commands you can execute from the home screen are **GetCalc(**, **Get(**, and **Send(**.

## Browsing the TI-84 Plus CE Catalog

### Selecting an Item from the CATALOG

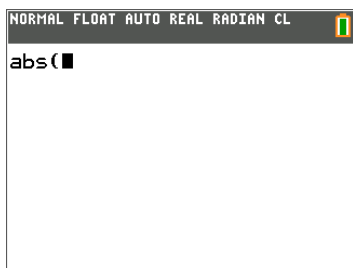
To browse and select a **CATALOG** item, follow these steps.

1. Press  $\boxed{2nd}$   $\boxed{[catalog]}$  to display the **CATALOG**.



The  $\blacktriangleright$  in the first column is the selection cursor.

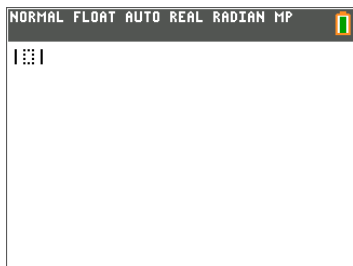
2. Press  $\boxed{\downarrow}$  or  $\boxed{\uparrow}$  to scroll the **CATALOG** until the selection cursor points to the item you want.
  - To jump to the first item beginning with a particular letter, press that letter; alpha-lock is on.
  - Items that begin with a number are in alphabetical order according to the first letter after the number. For example, **2-PropZTest**( is among the items that begin with the letter **P**.
  - Functions that appear as symbols, such as  $+$ ,  $^{-1}$ ,  $<$ , and  $\sqrt{\quad}$ , follow the last item that begins with **Z**. To jump to the first symbol, **I**, press  $\boxed{[0]}$ .
3. Press  $\boxed{enter}$  to paste the item to the current screen.



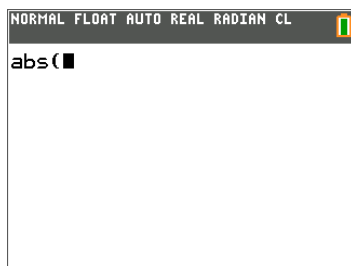
#### Note:

- From the top of the **CATALOG** menu, press  $\boxed{\uparrow}$  to move to the bottom. From the bottom, press  $\boxed{\downarrow}$  to move to the top.
- When your TI-84 Plus CE is in MathPrint™ mode, many functions will paste the MathPrint™ template on the home screen. For example, **abs**( pastes the absolute value template on the home screen instead of **abs**(.





MathPrint™



Classic

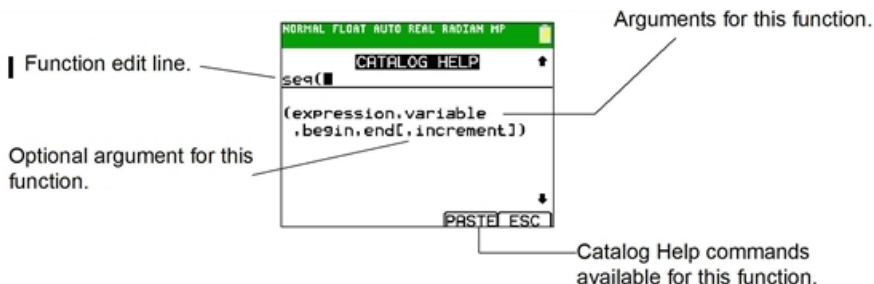
## Using Catalog Help

### Displaying Catalog Help

You can display Catalog Help arguments for functions in two ways:

- Using an alpha/numeric function listing in the catalog (e.g.,  $\boxed{2nd}$  [catalog]).
- Using the functions listed in certain menus (e.g.,  $\boxed{math}$ ).

Catalog Help lists the valid arguments for the function under the edit line. Arguments in brackets are optional.




1. Display the menu that contains the function.
2. Use  $\boxed{\uparrow}$  and/or  $\boxed{\downarrow}$  to move the cursor to the function.
3. Press  $\boxed{+}$  to display arguments for the function. The cursor is on the function edit line.

### Note:

- The catalog ( $\boxed{2nd}$  [catalog]) is displayed in alphabetical order. When you display the catalog, the alpha-lock is turned on. Press the first letter of the function name to skip function names that come before it alphabetically. Use  $\boxed{\uparrow}$  and/or  $\boxed{\downarrow}$  to move the cursor to the function.
- Not all catalog functions have associated arguments. If the function does not require an argument, Catalog Help displays the message ***"No arguments required for this item."***

### Catalog Help Commands

- Select **MORE** (if available) to display more arguments for the function.

NORMAL FLOAT AUTO REAL RADIAN MP 

CATALOG HELP ↑

dim(


---

(listname)

(matrixname)

↓

MORE | PASTE| ESC |

NORMAL FLOAT AUTO REAL RADIAN MP 

CATALOG HELP ↑

Disp ■

---


[valueA,valueB,valueC,....  
value n]

no arguments

↓

PASTE| ESC |

- Use shortcut menus  $\alpha$  [f1] through [f4] through for argument values if available.

NORMAL FLOAT AUTO REAL RADIAN MP 

CATALOG HELP ↑

LinReg(a+bx) L1,L2,

---

[Xlistname,Ylistname  
,frealist,regesq]

1	:Y1	6	:Y6
2	:Y2	7	:Y7
3	:Y3	8	:Y8
4	:Y4	9	:Y9
5	:Y5	0	:Y0

↓

FRAC | FUNC | **VAR**

- Enter your argument values on the function edit line, and then select **PASTE** to paste the function and the argument values you entered.

**Note:** You can paste to most cursor locations.

NORMAL FLOAT AUTO REAL RADIAN MP 

CATALOG HELP ↑

LinReg(a+bx) L1,L2,Y3 ■

---

[Xlistname,Ylistname  
,frealist,regesq]

↓

PASTE| ESC |

- Select **ESC** to exit the Catalog Help screen.

## Entering and Using Strings

### What Is a String?

A string is a sequence of characters that you enclose within quotation marks. On the TI-84 Plus CE, a string has two primary applications.

- It defines text to be displayed in a program.
- It accepts input from the keyboard in a program.

Characters are the units that you combine to form a string.

- Each number, letter, and space counts as one character.
- Each instruction or function name, such as **sin**( or **cos**(, counts as one character; the TI-84 Plus CE interprets each instruction or function name as one character.

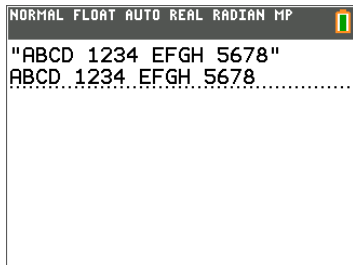
### Entering a String

To enter a string on a blank line on the home screen or in a program, follow these steps.

1. Press  $\boxed{\text{alpha}}$   $\boxed{[ ]}$  to indicate the beginning of the string.
2. Enter the characters that comprise the string.
  - Use any combination of numbers, letters, function names, or instruction names to create the string.
  - To enter a blank space, press  $\boxed{\text{alpha}}$   $\boxed{[_]}$ .
  - To enter several alpha characters in a row, press  $\boxed{\text{alpha}}$   $\boxed{[\text{A-lock}]}$  to activate alpha-lock.
3. Press  $\boxed{\text{alpha}}$   $\boxed{[ ]}$  to indicate the end of the string.

*"string"*

4. Press  $\boxed{\text{enter}}$ . On the home screen, the string is displayed on the next line without quotations. An ellipsis (...) indicates that the string continues beyond the screen. To scroll to see the entire string, press  $\boxed{\blacktriangleright}$  and  $\boxed{\blacktriangleleft}$ .



**Note:** A string must be enclosed in quotation marks. The quotation marks do not count as string characters.

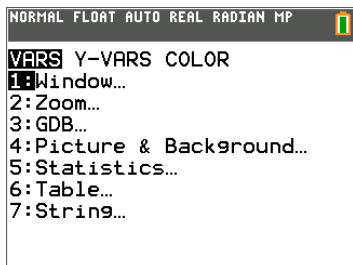
## Storing Strings to String Variables

### String Variables

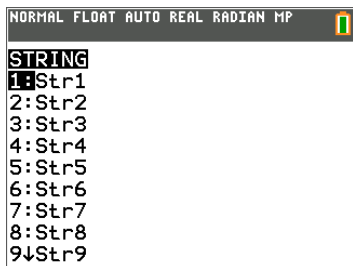
The TI-84 Plus CE, has 10 variables to which you can store strings. You can use string variables with string functions and instructions.

To display the **VAR** **STRING** menu, follow these steps.

1. Press **[vars]** to display the **VAR** menu. Move the cursor to **7:String**.



2. Press **[enter]** to display the **STRING** secondary menu.



### Storing a String to a String Variable

To store a string to a string variable, follow these steps.

1. Press **[alpha]** **["]**, enter the string, and press **[alpha]** **["]**.
2. Press **[sto→]**.
3. Press **[vars]** **7** to display the **VAR** **STRING** menu.
4. Select the string variable (from **Str1** to **Str9**, or **Str0**) to which you want to store the string.

```
NORMAL FLOAT AUTO REAL RADIAN MP
STRING
1:Str1
2:Str2
3:Str3
4:Str4
5:Str5
6:Str6
7:Str7
8:Str8
9↓Str9
```

The string variable is pasted to the current cursor location, next to the store symbol (→).

5. Press `enter` to store the string to the string variable. On the home screen, the stored string is displayed on the next line without quotation marks.

```
NORMAL FLOAT AUTO REAL RADIAN MP
"HELLO"→Str2
HELLO
█
```

### Displaying the Contents of a String Variable

To display the contents of a string variable on the home screen, select the string variable from the **VARS STRING** menu, and then press `enter`. The string is displayed.

```
NORMAL FLOAT AUTO REAL RADIAN MP
Str2
HELLO
█
```

## String Functions and Instructions in the CATALOG

### Displaying String Functions and Instructions in the CATALOG

String functions and instructions are available only from the CATALOG. The table below lists the string functions and instructions in the order in which they appear among the other **CATALOG** menu items. The ellipses in the table indicate the presence of additional CATALOG items.

---

#### CATALOG

...	
Equ►String(	Converts an equation to a string.
...	
expr(	Converts a string to an expression.
...	
inString(	Returns a character's place number.
...	
length(	Returns a string's character length.
...	
String►Equ(	Converts a string to an equation.
sub(	Returns a string subset as a string.
...	

---

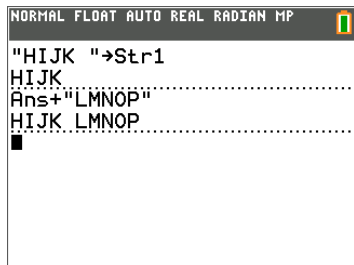
#### Concatenation

To concatenate two or more strings, follow these steps.

1. Enter *string1*, which can be a string or string name.
2. Press  $\boxed{+}$ .
3. Enter *string2*, which can be a string or string name. If necessary, press  $\boxed{+}$  and enter *string3*, and so on.

*string1+string2+string3...*

4. Press  $\boxed{\text{enter}}$  to display the strings as a single string.



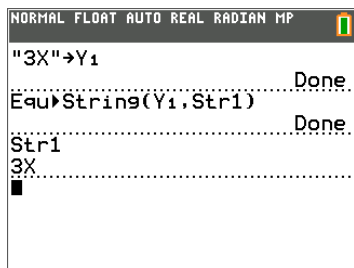
## Selecting a String Function from the CATALOG

To select a string function or instruction and paste it to the current screen, follow the steps for selecting an item from the CATALOG.

### EquString(

**EquString(** converts an equation to a string. The equation must be stored in a VARS Y-VARS variable.  $Yn$  contains the equation. **Strn** (from **Str1** to **Str9**, or **Str0**) is the string variable to which you want the equation to be stored.

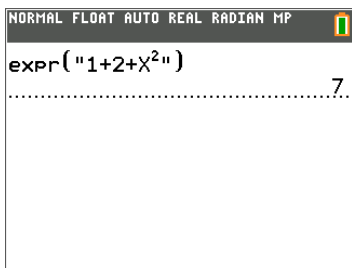
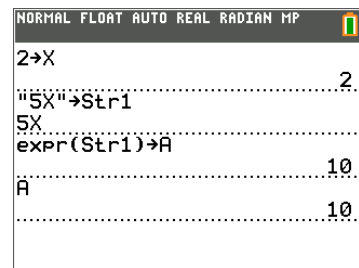
### EquString( $Yn, Strn$ )



### expr(

**expr(** converts the character string contained in *string* to an expression and executes the expression. *string* can be a string or a string variable.

### expr(*string*)

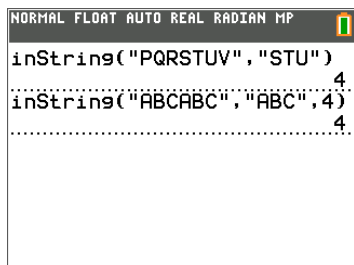




## inString(

**inString(** returns the character position in *string* of the first character of *substring*. *string* can be a string or a string variable. *start* is an optional character position at which to start the search; the default is 1.

**inString(string,substring[,start])**



```
NORMAL FLOAT AUTO REAL RADIAN MP
inString("PQRSTUV","STU")
.....4
inString("ABCABC","ABC",4)
.....4
```

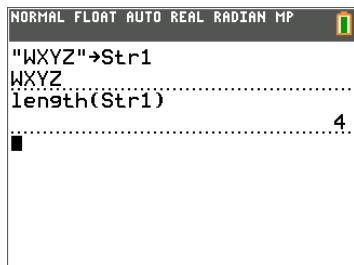
**Note:** If *string* does not contain *substring*, or *start* is greater than the length of *string*, **inString(** returns **0**.

## length(

**length(** returns the number of characters in *string*. *string* can be a string or string variable.

**Note:** An instruction or function name, such as **sin(** or **cos(**, counts as one character.

**length(string)**

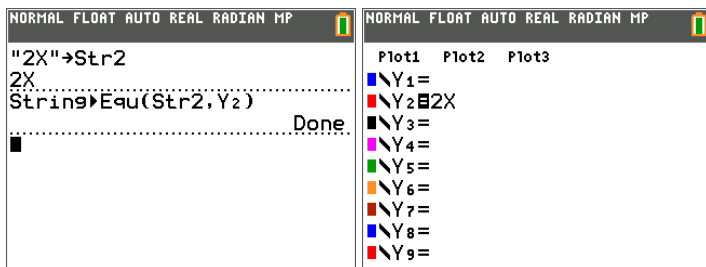


```
NORMAL FLOAT AUTO REAL RADIAN MP
"WXYZ"→Str1
WXYZ
length(Str1)
.....4
```

## String→Equ(

**String→Equ(** converts *string* into an equation and stores the equation to **Yn**. *string* can be a string or string variable. **String→Equ(** is the inverse of **Equ→String(**.

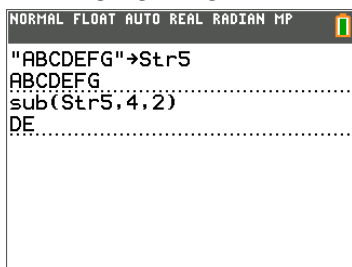
**String→Equ(string,Yn)**



## sub(

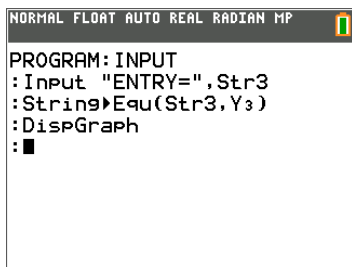
**sub(** returns a string that is a subset of an existing *string*. *string* can be a string or a string variable. *begin* is the position number of the first character of the subset. *length* is the number of characters in the subset.

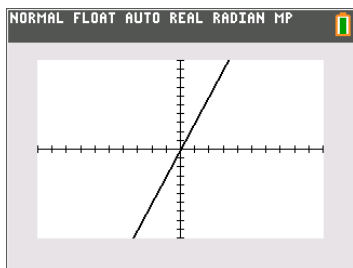
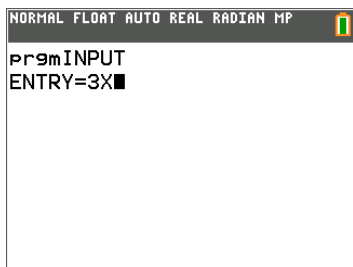
**sub(string,begin,length)**



## Entering a Function to Graph during Program Execution

In a program, you can enter a function to graph during program execution using these commands.





**Note:** When you execute this program, enter a function to store to **Y3** at the **ENTRY=** prompt.

## Hyperbolic Functions in the CATALOG

### Hyperbolic Functions

The hyperbolic functions are available only from the CATALOG. The table below lists the hyperbolic functions in the order in which they appear among the other CATALOG menu items. The ellipses in the table indicate the presence of additional CATALOG items.

---

CATALOG	
...	
$\cosh()$	Hyperbolic cosine
$\cosh^{-1}()$	Hyperbolic arccosine
...	
$\sinh()$	Hyperbolic sine
$\sinh^{-1}()$	Hyperbolic arcsine
...	
$\tanh()$	Hyperbolic tangent
$\tanh^{-1}()$	Hyperbolic arctangent
...	

---

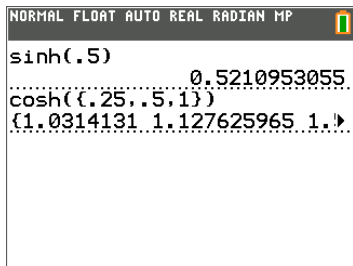
### $\sinh()$ , $\cosh()$ , $\tanh()$

$\sinh()$ ,  $\cosh()$ , and  $\tanh()$  are the hyperbolic functions. Each is valid for real numbers, expressions, and lists.

$\sinh(\text{value})$

$\cosh(\text{value})$

$\tanh(\text{value})$



### $\sinh^{-1}()$ , $\cosh^{-1}()$ , $\tanh^{-1}()$

$\sinh^{-1}()$  is the hyperbolic arcsine function.  $\cosh^{-1}()$  is the hyperbolic arccosine function.  $\tanh^{-1}()$  is the hyperbolic arctangent function. Each is valid for real numbers, expressions, and lists.

$\sinh^{-1}(\text{value})$

$\cosh^{-1}(\text{value})$

$\tanh^{-1}(\text{value})$

```
NORMAL FLOAT AUTO REAL RADIAN MP
sinh⁻¹({0,1})
{0.881373587}
tanh⁻¹(-.5)
-0.5493061443
█
```

## Commands and Functions Listing

The purpose of this table of information is to provide a short description with syntax of command arguments as appropriate and menu locations for each command or function in the [Catalog listing](#) in the calculator.

This table is useful for executing commands when using the calculator or creating TI-Basic programs.

Items whose names are not alphabetic (such as +, !, and >) are listed in the [Arithmetic Operations, Test Relations, and Symbols](#) section. Unless otherwise specified, all examples in this section were performed in the default reset mode, and all variables are assumed to be the default value of 0.

From the **CATALOG**, you can paste any function or command to the home screen or to a command line in the program editor.

The same syntax information for function and command arguments below is available on the calculator and also in the TI Connect™ CE Program Editor.

- On the calculator, pressing [+ ] when a function or command is highlighted in the menu listing will display the Catalog Help syntax editor to assist your entries.
- Using TI Connect™ CE Program Editor, the catalog listing also displays the syntax of the arguments for functions and commands.

Note that some functions and commands are only valid when executed in a TI-Basic program and not from the home screen.

The items in this table appear in the same order as they appear in the **CATALOG** ([\[2nd\]](#) [catalog].)

In the table below, the † symbol indicates either keystrokes or certain commands which are only available in the Program Editor mode on the calculator. Press [\[prgm\]](#) and select to **EDIT** an existing program or **NEW** to start a new program to set the calculator in the Program Edit mode.

Some arguments are optional. Optional arguments will be indicated within [ ] in the syntax help given in the table below. [ ] are not symbols on the calculator and are not to be typed in. They are used here only to indicate an optional argument.

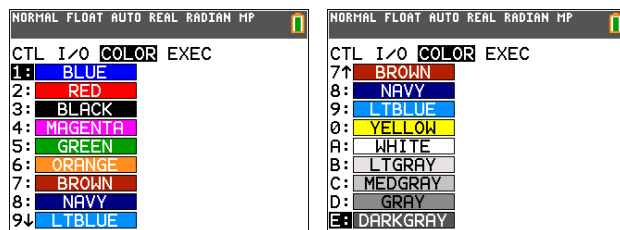
On the calculator, functions and commands paste as "tokens." This means they paste as one character and not as individual letters, symbols and spaces. Do not attempt to type in any function or command on the calculator. Just paste the token from menu locations. Watch the cursor jump over tokens as you edit to get a better understanding of tokens.

In TI Connect™ CE Program Editor, you can "feel" the same experience of pasting tokens when using the Catalog tree provided in that editor. You also can type in the functions and commands if you know the correct format and syntax. TI Connect™ CE "tokenizes" the functions and commands when you send the program to the calculator. However, you must type in the functions and commands exactly as the tokens. Note that some commands will have spaces as part of the token which you might not see. **For example**, Pause command as a token has a space at the end. Once you send the

program to the calculator, you can run the program and if there are any syntax errors, you can fix the issues on either the calculator or in TI Connect™ CE Program Editor.

CTL	I/O	COLOR	EXEC
		<b>Color Numbers</b>	<b>Names</b>
		10	BLUE
		11	RED
		12	BLACK
		13	MAGENTA
		14	GREEN
		15	ORANGE
		16	BROWN
		17	NAVY
		18	LTBLUE
		19	YELLOW
		20	WHITE
		21	LTGRAY
		22	MEDGRAY
		23	GRAY
		24	DARKGRAY

You can also choose a name in the `[vars]` menu (**COLOR** sub-menu).



### GraphColor(*function#*,*color#*)

For example, **GraphColor(2,4)** or **GraphColor(2,MAGENTA)**.

## Alpha CATALOG Listing

### A

#### abs()

**abs**(*value*)

Returns the absolute value of a real number, expression, list, or matrix.

**MATH**  
**NUM**  
**1:abs(**

#### abs()

**abs**(*complex value*)

Returns the magnitude of a complex number or list.

**MATH**  
**CMPLX**  
**5:abs(**

#### and

*valueA* **and** *valueB*

Returns 1 (true) when both *valueA* and *valueB* are true. Otherwise, return is 0 (false).

*valueA* and *valueB* can be real numbers, expressions, or lists.

#### TI Connect™ Program Editor Tip:

Notice the token is "\_and\_" where "\_" is a space.

**2nd** **[TEST]**  
**LOGIC**  
**1:and**

#### angle()

**angle**(*value*)

Returns the polar angle of a complex number or list of complex numbers.

**MATH**  
**CMPLX**  
**4:angle(**

#### ANOVA()

**ANOVA**(*list1*,*list2*,*list3*,...,*list20*)

Performs a one-way analysis of variance for comparing the means of two to 20 populations.

**STAT**  
**TESTS**  
**H:ANOVA(**

#### Ans

**Ans**

Returns the last answer.

**2nd** **[ANS]**



## Archive

### Archive *variables*

**2nd** [MEM]

Moves the specified *variable* from RAM to the user data archive memory.

5:Archive

## Asm()

### Asm(*assemblyprgname*)

**2nd**

Executes an assembly language program.

[CATALOG]

Asm(

## AsmComp()

### AsmComp(*prgmASM1*, *prgmASM2*)

**2nd**

Compiles an assembly language program written in ASCII and stores the hex version.

[CATALOG]

AsmComp(

## Asm84CEPrgm

### Asm84CEPrgm

**2nd** [CATALOG]

Must be used as the first line of an assembly language program.

Asm84CEPrgm

## augment()

### augment(*matrixA*, *matrixB*)

**2nd** [MATRIX]

Returns a matrix, which is *matrixB* appended to *matrixA* as new columns.

MATH

7:augment(

## augment()

### augment(*listA*, *listB*)

**2nd** [LIST]

Returns a list, which is *listB* concatenated to the end of *listA*.

OPS

9:augment(

## AUTO Answer

### AUTO

[MODE]

Displays answers in a similar format as the input.

Answers:

AUTO

## AxesOff

### AxesOff

+ **2nd**

## AxesOff

Turns off the graph axes.

[FORMAT]  
AxesOff

## AxesOn

### AxesOn[*color*#]

Turns on the graph axes with color. The *color* option allows the color of the axes to be specified.

Color#: 10 - 24 or color name pasted from [vars] COLOR..

+ [2nd]  
[FORMAT]  
AxesOn

## $a+bi$

### $a+bi$

Sets the mode to rectangular complex number format ( $a+bi$ ).

+ [MODE]  
 $a+b i$

## B

## BackgroundOff

### BackgroundOff

Turns off background image in the graph area.

+ [2nd] [DRAW]  
BACKGROUND  
2:BackgroundOff:

## BackgroundOn

### BackgroundOn *n*

Displays a menu the Background Image Var *n* (Image#*n*) specified in the graph area.

+ [2nd] [DRAW]  
BACKGROUND  
1:BackgroundOn

**bal(****bal**(*npmt* [, *roundvalue*])

Computes the balance at *npmt* for an amortization schedule using stored values for **PV**, **I%**, and **PMT** and rounds the computation to *roundvalue*.

[APPS]

1:Finance  
CALC  
9:bal(

**binomcdf(****binomcdf**(*numtrials*, *p*, *x*)

Computes a cumulative probability at *x* for the discrete binomial distribution with the specified *numtrials* and probability *p* of success on each trial.

[2nd] [DISTR]

DISTR  
B:binomcdf(

**binompdf(****binompdf**(*numtrials*, *p*, *x*)

Computes a probability at *x* for the discrete binomial distribution with the specified *numtrials* and probability *p* of success on each trial.

[2nd] [DISTR]

DISTR  
A:binompdf(

**BorderColor****BorderColor**[*color#*]

Turns on a border color surrounding the graph area with the specified color. Color #: 1-4.

+ [2nd]

[FORMAT]

BorderColor

**Boxplot****Boxplot** Plot#(*type*, *Xlist*, [*frequlist*, *color#*])

Defines Plot# (1, 2, or 3) of type

+ [2nd]

[stat plot]

TYPE

**C****checkTmr(****checkTmr**(*starttime*)

Returns the number of seconds since you used **startTmr** to start the timer. The *starttime* is the value displayed by **startTmr**.

[2nd] [CATALOG]

checkTmr(

## $\chi^2$ cdf(

$\chi^2$ cdf(lowerbound,upperbound,df)

**2nd** [DISTR]  
DISTR  
8:  $\chi^2$  cdf(

Computes the  $\chi^2$  distribution probability between *lowerbound* and *upperbound* for the specified degrees of freedom *df*.

## $\chi^2$ pdf(

$\chi^2$ pdf(x,df)

**2nd** [DISTR]  
DISTR  
7:  $\chi^2$  pdf(

Computes the probability density function (pdf) for the  $\chi^2$  distribution at a specified *x* value for the specified degrees of freedom *df*.

## $\chi^2$ -Test(

$\chi^2$ -Test(observedmatrix,expectedmatrix  
[,drawflag,color#])

+ [STAT]  
TESTS  
C:  $\chi^2$  - Test  
(

Performs a chi-square test. *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## $\chi^2$ GOF

$\chi^2$ GOF-Test(observedlist,expectedlist,df  
[,drawflag,color#])

+ [STAT]  
TESTS  
D:  $\chi^2$  GOF -  
Test(

Performs a test to confirm that sample data is from a population that conforms to a specified distribution.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Circle(

Circle(X,Y,radius[,color#,linestyle#])

**2nd** [DRAW]  
DRAW  
9: Circle(

Draws a circle with center (*X*,*Y*) and *radius* with specified

Color#: 10 - 24 or color name pasted from [vars] COLOR.

linestyle#: 1-2.

## CLASSIC

### CLASSIC

Displays inputs and outputs on a single line, such as 1/2+3/4.

**[MODE]**  
CLASSIC

## Clear Entries

### Clear Entries

Clears the contents of the Last Entry storage area.

**[2nd] [MEM]**  
MEMORY  
3:Clear  
Entries

## ClockOff

### ClockOff

Turns off the clock display in the mode screen.

**[2nd]**  
[CATALOG]  
ClockOff

## ClockOn

### ClockOn

Turns on the clock display in the mode screen.

**[2nd]**  
[CATALOG]  
ClockOn

## ClrAllLists

### ClrAllLists

Sets to **0** the dimension of all lists in memory.

**[2nd] [MEM]**  
MEMORY  
4:ClrAllLists

## ClrDraw

### ClrDraw

Clears all drawn elements from a graph or drawing.

**[2nd] [DRAW]**  
DRAW  
1:ClrDraw

## ClrHome

### ClrHome

Clears the home screen.

**+ [PRGM]**  
I/O  
8:ClrHome

## ClrList

**ClrList***listname1[,listname2, ...,listname n]*

**[STAT]**

**EDIT**

**4:ClrList**

Sets the dimension of one or more listnames to 0.

## ClrTable

**ClrTable**

+ **[PRGM]**

**I/O**

**9:ClrTable**

Clears all values from the table.

## conj(

**conj**(*value*)

**[MATH]**

**CMPLX**

**1:conj(**

Returns the complex conjugate of a complex number or list of complex numbers.

## CoordOff

**CoordOff**

+ **[2nd]**

**[FORMAT]**

**CoordOff**

Turns off cursor coordinate value display.

## CoordOn

**CoordOn**

+ **[2nd]**

**[FORMAT]**

**CoordOn**

Turns on cursor coordinate value display.

## cos(

**cos**(*value*)

**[COS]**

Returns cosine of a real number, expression, or list.

## $\cos^{-1}$ (

**$\cos^{-1}$** (*value*)

**[2nd] [cos<sup>-1</sup>]**

Returns arccosine of a real number, expression, or list.

## cosh(

**cosh**(*value*)

**[2nd]**

**cosh(**

Returns hyperbolic cosine of a real number, expression, or list.

[CATALOG]

cosh(

**cosh<sup>-1</sup>(**

**cosh<sup>-1</sup>** (*value*)

Returns hyperbolic arccosine of a real number, expression, or list.

**2nd**

[CATALOG]

cosh<sup>-1</sup> (

**CubicReg**

**CubicReg** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

Fits a cubic regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**STAT**

CALC

6:CubicReg

**cumSum(**

**cumSum**(*list*)

Returns a list of the cumulative sums of the elements in *list*, starting with the first element.

**2nd** [LIST]

OPS

6:cumSum(

**cumSum(**

**cumSum**(*matrix*)

Returns a matrix of the cumulative sums of *matrix* elements. Each element in the returned matrix is a cumulative sum of a *matrix* column from top to bottom.

**2nd** [MATRIX]

MATH

0:cumSum(

## D

### dayOfWk(

**dayOfWk**(*year,month,day*)

Returns an integer from 1 to 7, with each integer representing a day of the week. Use **dayOfWk**( to determine on which day of the week a particular date would occur. The *year* must be 4 digits; *month* and *day* can be 1 or 2 digits.

**2nd** [CATALOG]

**dayOfWk**(  
1:Sunday  
2:Monday  
3:Tuesday...

### dbd(

**dbd**(*date1,date2*)

Calculates the number of days between *date1* and *date2* using the actual-day-count method.

[APPS]

1:Finance  
CALC  
D:dbd(

### DEC Answers

#### DEC

Displays answers as integers or decimal numbers.

[MODE]

Answers:  
DEC

### ►Dec

*value*►Dec

Displays a real or complex number, expression, list, or matrix in decimal format.

[MATH]

MATH  
2: ► Dec

### Degree

#### Degree

Sets degree angle mode.

+ [MODE]

Degree

### DelVar

**DelVar** *variable*

Deletes from memory the contents of *variable*.

+ [PRGM]

CTL  
G:DelVar

### DependAsk

**DependAsk**

Sets table to ask for dependent-variable values.

+ **2nd** [TBLSET]

Depend: Ask



## DependAuto

### DependAuto

Sets table to generate dependent-variable values automatically.

+ [2nd]  
[TBLSET]  
Depend:  
Auto

## det(

### det(*matrix*)

Returns determinant of *matrix*.

[2nd]  
[MATRIX]  
MATH  
1:det(

## DetectAsymOff

### DetectAsymOff

Turns off checks for rational function asymptotes when graphing. Impacts graph speed. Does not perform extra calculations to detect asymptotes pixel to pixel while graphing. Pixels will connect across the screen even across an asymptote.

+ [2nd] [FORMAT]  
DetectAsymOff

## DetectAsymOn

### DetectAsymOn

Turns on checks for rational function asymptotes when graphing. Impacts graph speed. Performs more calculations and will not connect pixels across an asymptote on a graph.

+ [2nd] [FORMAT]  
DetectAsymOn

## DiagnosticOff

### DiagnosticOff

Sets diagnostics-off mode;  $r$ ,  $r^2$ , and  $R^2$  are not displayed as regression model results.

[2nd] [CATALOG]  
DiagnosticOff

## DiagnosticOn

### DiagnosticOn

**2nd** [CATALOG]

DiagnosticOn

Sets diagnostics-on mode;  $r$ ,  $r^2$ , and  $R^2$  are displayed as regression model results.

## dim(

### dim(*listname*)

**2nd** [LIST]

OPS

3:dim(

Returns the dimension of *listname*.

## dim(

### dim(*matrixname*)

**2nd**

[MATRIX]

MATH

3:dim(

Returns the dimension of *matrixname* as a list.

## dim(

### *length*→dim(*listname*)

**2nd** [LIST]

OPS

3:dim(

Assigns a new dimension (*length*) to a new or existing *listname*.

## dim(

### {*rows,columns*}→dim(*matrixname*)

**2nd** [MATRIX]

MATH

3:dim(

Assigns new dimensions to a new or existing *matrixname*.

## Disp

### Disp

+ **PRGM**

I/O

3:Disp

Displays the home screen.

## Disp

### Disp [*valueA,valueB,valueC,...,value n*]

+ **PRGM**

I/O

3:Disp

Displays each value.

## DispGraph

### DispGraph

Displays the graph.

+ [PRGM]

I/O

4:DispGraph

## DispTable

### DispTable

Displays the table.

+ [PRGM]

I/O

5:DispTable

## ►DMS

### *value*►DMS

Displays *value* in DMS format.

[2nd]

[ANGLE]

ANGLE

4: ► DMS

## Dot-Thick

### Dot-Thick

Sets dot plotting mode; resets all Y=editor graph-style settings to Dot-Thick.

+ [MODE]

Dot-Thick

## Dot-Thin

### Dot-Thin

Sets dot plotting mode; resets all Y=editor graph-style settings to Dot-Thin.

+ [MODE]

Dot-Thin

## DrawF

### DrawF*expression*[*color*#]

Draws *expression* (in terms of **X**) on the graph with specified

Color#:10 - 24 or color name pasted from [vars] COLOR.

[2nd] [DRAW]

DRAW

6:DrawF

## DrawInv

**DrawInv***expression*[*color*#]

**2nd** **[DRAW]**  
**DRAW**  
**8:DrawInv**

Draws the inverse of *expression* by plotting **X** values on the y-axis and **Y** values on the x-axis with specified

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## DS<(

**DS<**(*variable,value*):*commandA:commands*

**+** **[PRGM]**  
**CTL**  
**B:DS<**(

Decrements *variable* by 1; skips *commandA* if *variable* < *value*.

## E

### e

**e**

**2nd** **[e]**

Returns decimal approximation of the constant **e**.

### e^(

**e^(***power*)

**2nd** **[e<sup>x</sup>]**

Returns **e** raised to *power*.

### e^(

**e^(***list*)

**2nd** **[e<sup>x</sup>]**

Returns a list of **e** raised to a *list* of powers.

## E

### Exponent:

*value***E***exponent*

**2nd** **[EE]**

Returns *value* times 10 to the *exponent*.

## E

### Exponent:

*list***E***exponent*

**2nd** **[EE]**

Returns *list* elements times 10 to the *exponent*.

## E

### Exponent:

*matrix***E***exponent*

**[2nd]** **[EE]**

Returns *matrix* elements times 10 to the *exponent*.

### ►Eff(

►Eff(*nominal rate*,  
*compounding periods*)

**[APPS]** 1:Finance  
CALC  
C: ► Eff(

Computes the effective interest rate.

## Else

### Else

See [If:Then:Else](#)

## End

### End

† **[PRGM]**  
CTL  
7:End

Identifies end of **For**, **If-Then-Else**, **Repeat**, or **While** loop.

## Eng

### Eng

† **[MODE]**  
Eng

Sets engineering display mode.

### Equ►String(

**Equ►String**(**Y=** *var*,**Strn**)

**[2nd]**  
**[CATALOG]**  
Equ ► String  
(

Converts the contents of a **Y=** *var* to a string and stores it in **Strn**

### eval(

**eval**(*expression*)

† **[PRGM]**  
I/O  
C:eval(

Returns an evaluated expression as a string with 8 significant digits. The expression must be real.

**eval(****eval**(*expression*)† [PRGM]  
HUB  
6:eval(

Returns an evaluated expression as a string with 8 significant digits. The expression must simplify to a real expression.

**ExecLib****ExecLib**† [PRGM]  
CTL  
K:ExecLib

Extends TI-Basic (not available)

**expr(****expr**(*string*)† [PRGM]  
I/O  
expr(Converts the character string contained in *string* to an expression and executes the expression. *string* can be a string or a string variable.**ExpReg****ExpReg** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*][STAT]  
CALC  
0:ExpRegFits an exponential regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.**ExprOff****ExprOff**† [2nd]  
[FORMAT]  
ExprOffTurns off the expression display during **TRACE**.**ExprOn****ExprOn**† [2nd]  
[FORMAT]  
ExprOnTurns on the expression display during **TRACE**.**F****Fcdf(****Fcdf**(*lowerbound*,*upperbound*,*numerator*  
*df*,*denominator df*)[2nd] [DISTR]  
DISTR  
0: Fcdf(Computes the F distribution probability between *lowerbound* and *upperbound* for the specified *numerator df* (degrees of freedom) and *denominator df*.

► F ◀► D

► F ◀► D

Converts an answer from a fraction to a decimal or from a decimal to a fraction. Fraction and or decimal may be an approximation.

**[ALPHA]** **[F-1]**

4: ► F ◀► D

or

**[MATH]**

NUM

B: ► F ◀► D

**[MATH]**

FRAC

3: ► F ◀► D

**Fill(**

**Fill(*value*,*matrixname*)**

Stores *value* to each element in *matrixname*.

**[2nd]**

**[MATRIX]**

**MATH**

4:Fill(

**Fill(**

**Fill(*value*,*listname*)**

Stores *value* to each element in *listname*.

**[2nd]** **[LIST]**

**OPS**

4:Fill(

**Fix**

**Fix #**

Sets fixed-decimal mode for # of decimal places.

**+ [MODE]**

**0123456789**

**(select one)**

## Float

### Float

Sets floating decimal mode.

† **MODE**  
Float

## fMax{

**fMax**(*expression,variable,lower,upper[,tolerance]*)

Returns the value of *variable* where the local maximum of *expression* occurs, between *lower* and *upper*, with specified *tolerance*.

**MATH**  
**MATH**  
7:fMax{

## fMin{

**fMin**(*expression,variable,lower,upper[,tolerance]*)

Returns the value of *variable* where the local minimum of *expression* occurs, between *lower* and *upper*, with specified *tolerance*.

**MATH**  
**MATH**  
6:fMin{

## fnInt{

**fnInt**(*expression,variable,lower,upper[,tolerance]*)

Returns the function integral of *expression* with respect to *variable*, between *lower* and *upper*, with specified *tolerance*.

**MATH**  
**MATH**  
9:fnInt{

## FnOff

**FnOff** [*function#,function#,...function n*]

Deselects all **Y=** functions or specified **Y=** functions.

**VARS**  
Y-VARS  
4:On/Off  
2:Fnoff

## FnOn

**FnOn** [*function#,function#,...function n*]

Selects all **Y=** functions or specified **Y=** functions.

**VARS**  
Y-VARS  
4:On/Off  
1:Fnon

## For{

**:For**(*variable,begin,end*  
*[,increment]*):**commands:End:commands**

† **PRGM**  
CTL  
4:For{



## For(

Executes *commands* through **End**, incrementing *variable* from *begin* by *increment* until *variable*>*end*.

## fPart(

**fPart**(*value*)

Returns the fractional part or parts of a real or complex number, expression, list, or matrix.

**[MATH]**  
NUM  
4:fPart(

## Fpdf(

**Fpdf**(*x*,*numerator df*,*denominator df*)

Computes the  $F$  distribution probability between *lowerbound* and *upperbound* for the specified *numerator df* (degrees of freedom) and *denominator df*.

**[2nd]** **[DISTR]**  
DISTR  
9: **Fpdf**(

## ►Frac

*value*►**Frac**

Displays a real or complex number, expression, list, or matrix as a fraction simplified to its simplest terms.

**[MATH]**  
MATH  
1: ► **Frac**

## Full

**Full**

Sets full screen mode.

+ **[MODE]**  
Full

## Func

**Func**

Sets function graphing mode.

+ **[MODE]**  
Func

## G

### GarbageCollect

**GarbageCollect**

Displays the garbage collection menu to allow cleanup of unused archive memory.

**[2nd]** **[CATALOG]**  
GarbageCollect

## gcd(

**gcd**(*valueA*,*valueB*)

Returns the greatest common divisor of *valueA* and *valueB*, which can be real numbers or lists.

**MATH**  
**NUM**  
**9:gcd(**

## geometcdf(

**geometcdf**(*p*,*x*)

Computes a cumulative probability at *x*, the number of the trial on which the first success occurs, for the discrete geometric distribution with the specified probability of success *p*.

**2nd** **[DISTR]**  
**DISTR**  
**F:geometcdf(**

## geometpdf(

**geometpdf**(*p*,*x*)

Computes a probability at *x*, the number of the trial on which the first success occurs, for the discrete geometric distribution with the specified probability of success *p*.

**2nd** **[DISTR]**  
**DISTR**  
**E:geometpdf(**

## Get(

**Get**(*variable*)

Retrieves a value from a connected TI-Innovator™ Hub and stores the data to a variable on the receiving CE calculator.

**Note:** See also [Send\(](#) and [eval\(](#)

† **[PRGM]**  
**I/O**  
**A:Get(**

## Get(

**Get**(*variable*)

Retrieves a value from a connected TI-Innovator™ Hub and stores the data to a variable on the receiving CE calculator.

**Note:** See also [Send\(](#) and [eval\(](#)

**Ti-Innovator™**  
**Hub**  
† **[PRGM]**  
**HUB**  
**5:Get**

## GetCalc(

**GetCalc**(*variable*[,*portflag*])

Gets contents of *variable* on another TI-84 Plus CE and stores it to *variable* on the receiving TI-84 Plus CE. By default, the TI-84 Plus CE uses the USB port if it is connected. If the USB cable is not connected, it uses the I/O port.

*portflag*=0 use USB port if connected;

*portflag*=1 use USB port;

*portflag*=2 use I/O port.(Ignored when program runs on the TI-84 Plus

† **[PRGM]**  
**I/O**  
**0:GetCalc(**

## GetCalc(

CE.)

## getDate

### getDate

**2nd** [CATALOG]

getDate

Returns a list giving the date according to the current value of the clock. The list is in *{year, month, day}* format.

## getDtFmt

### getDtFmt

**2nd**

[CATALOG]

getDtFmt

Returns an integer representing the date format that is currently set on the device.

1 = M/D/Y  
2 = D/M/Y  
3 = Y/M/D

## getDtStr(

### getDtStr(*integer*)

**2nd**

[CATALOG]

getDtStr(

Returns a string of the current date in the format specified by *integer*, where:

1 = M/D/Y  
2 = D/M/Y  
3 = Y/M/D

## getTime

### getTime

[2nd] [CATALOG]  
getTime

Returns a list giving the time according to the current value of the clock. The list is in *{hour,minute,second}* format. The time is returned in the 24 hour format.

## getTmFmt

### getTmFmt

[2nd]  
[CATALOG]  
getTmFmt

Returns an integer representing the clock time format that is currently set on the device.

12 = 12 hour format  
24 = 24 hour format

## getTmStr(

### getTmStr(*integer*)

[2nd]  
[CATALOG]  
getTmStr(

Returns a string of the current clock time in the format specified by *integer*, where:

12 = 12 hour format  
24 = 24 hour format

## getKey

### getKey

+ [PRGM]  
I/O  
7:getKey

Returns the key code for the current keystroke, or **0**, if no key is pressed.

## Goto

### Goto*label*

+ [PRGM]  
CTL  
0:Goto

Transfers control to *label*.

## GraphColor(

**GraphColor**(*function#*,*color#*)

+ [PRGM]

Sets the color for *function#*.

CTL

H:GraphColor(

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## GraphStyle(

**GraphStyle**(*function#*,*graphstyle#*)

+ [PRGM]

Sets a *graphstyle* for *function#*.

CTL

H:GraphStyle(

## GridDot

**GridDot** [*color#*]

+ [2nd]

Turns on grid dots in the graph area in the specified color.

[FORMAT]

GridDot

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## GridLine

**GridLine** [*color#*]

+ [2nd]

Turns on grid lines in the graph area in the specified color.

[FORMAT]

GridLine

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## GridOff

**GridOff**

+ [2nd] [FORMAT]

Turns off grid format.

GridOff

## G-T

**G-T**

+ [MODE]

Sets graph-table vertical split-screen mode.

GRAPH-

TABLE

## H

### Histogram

**Histogram** Plot#(*type*,*Xlist*,[,*freqlist*,*color#*])

+ [2nd]

Used as the "type" argument in the command

[stat plot]

## Histogram

Where # gives Plot1, Plot2 or Plot3.

TYPE

## Horiz

Horiz

+ [MODE]

Sets horizontal split-screen mode.

Horiz

## Horizontal

Horizontal  $y$ [,color#,linestyle#]

[2nd] [DRAW]

Draws a horizontal line at  $y$  in a specified

DRAW

Color#: 10 - 24 or color name pasted from [vars] COLOR.

3:Horizontal

line style #: 1-4.

/

*i*

*i*

[2nd] [*i*]

Returns the complex number *i*.

## identity(

identity(*dimension*)

[2nd] [MATRIX]

Returns the identity matrix of *dimension* rows x *dimension* columns.

MATH

5:identity(

If

If *condition:commandA:commands*

+ [PRGM]

If *condition* = 0 (false), skips *commandA*.

CTL

1:If

If

Then

End

If:*condition*Then:*commands*End:*commands*

+ [PRGM]

Executes *commands* from **Then** to **End** if *condition* = 1 (true).

CTL

2:Then

**If  
Then  
Else  
End**

**If:** *condition***Then:** *commands***Else:** *commands***End:** *commands*

+ [PRGM]  
CTL  
3:Else

Executes *commands* from **Then** to **Else** if *condition* = 1 (true); from **Else** to **End** if *condition* = 0 (false).

**imag(**

**imag**(*value*)

[MATH]  
CMPLX  
3:imag(

Returns the imaginary (non-real) part of a complex number or list of complex numbers.

**IndpntAsk**

**IndpntAsk**

+ [2nd]  
[TBLSET]  
Indpnt:  
Ask

Sets table to ask for independent-variable values.

**IndpntAuto**

**IndpntAuto**

+ [2nd]  
[TBLSET]  
Indpnt:  
Auto

Sets table to generate independent-variable values automatically.

**Input**

**Input**

+ [PRGM]  
I/O  
2:Input

Displays graph.

**Input**

**Input** [*variable*]

+ [PRGM]  
I/O  
2:Input

**Input** ["*text*",*variable*]

Prompts for value to store to *variable*.

## Input

**Input** [*Strn,variable*]

Displays **Strn** and stores entered value to *variable*.

+ **PRGM**  
I/O  
2:Input

## inString(

**inString**(*string,substring[,start]*)

Returns the character position in *string* of the first character of *substring* beginning at *start*.

**2nd**  
**CATALOG**  
inString(

## int(

**int**(*value*)

Returns the largest integer a real or complex number, expression, list, or matrix.

**MATH**  
NUM  
5:int(

## $\Sigma$ Int(

**$\Sigma$ Int**(*pmt1,pmt2[,roundvalue]*)

Computes the sum, rounded to *roundvalue*, of the interest amount between *pmt1* and *pmt2* for an amortization schedule.

**APPS**  
1:Finance  
CALC  
A:  $\Sigma$  Int(

## inBinom(

**inBinom**(*area,trial,p*)

The inverse binomial cumulative distribution function results in the minimum number of successes, such that the cumulative probability for that minimum number of successes  $\geq$  the given cumulative probability (area). If more information is needed, also find the binomcdf for the result from invBinom( as shown below for a full analysis.

**2nd** **DISTR**  
  
DISTR  
C:invBinom(

### Details:

Assume the toss of a fair coin 30 times. What is the minimum number of heads you must observe such that the cumulative probability for that number of observed heads is at least 0.95?

The results on the screen first show that the minimum number of successes to obtain at least the given cumulative probability of 0.95 is 19. Next, the cumulative probability for up to 19 is computed using binomcdf( and is approximately 0.9506314271 which meets the criteria of  $0.9506314271 \geq 0.95$



## invBinom(

```
NORMAL FLOAT AUTO REAL RADIAN MP
invBinom(.95,30,.5) 19
binomcdf(30,.5,19) 0.9506314271
```

### Alternate Method:

Set  $Y1 = \text{binomcdf}(30, 0.5, X)$  and use the table of values (starting at 0 and increment by 1) to find when the cumulative probability is at or just above the given cumulative probability. This gives you a view of all values to make decisions. For this example, search in the table to find the cumulative probability just larger than 0.95. Again, the number of successes is 19.

```
NORMAL FLOAT DEC REAL RADIAN MP
Plot1 Plot2 Plot3
Y1=binomcdf(30,0.5,X)
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
Y8=
Y9=
NORMAL FLOAT DEC REAL RADIAN MP
PRESS → TO EDIT FUNCTION


| X  | Y1     |  |  |  |  |
|----|--------|--|--|--|--|
| 13 | 0.2923 |  |  |  |  |
| 14 | 0.4278 |  |  |  |  |
| 15 | 0.5722 |  |  |  |  |
| 16 | 0.7077 |  |  |  |  |
| 17 | 0.8192 |  |  |  |  |
| 18 | 0.8998 |  |  |  |  |
| 19 | 0.9506 |  |  |  |  |
| 20 | 0.9786 |  |  |  |  |
| 21 | 0.9919 |  |  |  |  |
| 22 | 0.9974 |  |  |  |  |
| 23 | 0.9993 |  |  |  |  |


Y1=0.9506314270685
```

## invNorm(

$\text{invNorm}(\text{area}, \mu, \sigma, \text{tail})$

**2nd** DISTR  
DISTR  
3:invNorm(

tail [catalog]: LEFT, CENTER, RIGHT

Computes the inverse cumulative normal distribution function for a given area under the normal distribution curve specified by  $\mu$  and  $\sigma$ . The optional argument tail can be **LEFT**  $(-\infty, -a)$ , **CENTER**  $[-a, a]$  or **RIGHT**  $(a, \infty)$  for Real  $a$ .

The tokens **LEFT**, **CENTER** and **RIGHT** can be found in [catalog].

## LEFT

### LEFT

**2nd** [CATALOG]

LEFT

**LEFT** is a tail argument for the **invNorm(** command where the optional argument tail can be **LEFT** ( $-\infty,-a$ ), **CENTER**  $[-a,a]$  or **RIGHT**  $(a, \infty)$  for Real  $a$ .

See also **invNorm(**.

## RIGHT

### RIGHT

**2nd** [CATALOG]

RIGHT

**RIGHT** is a tail argument for the **invNorm(** command where the optional argument tail can be **LEFT** ( $-\infty,-a$ ), **CENTER**  $[-a,a]$  or **RIGHT**  $(a, \infty)$  for Real  $a$ .

See also **invNorm(**.

## CENTER

### CENTER

**2nd** [CATALOG]

CENTER

**CENTER** is a tail argument for the **invNorm(** command where the optional argument tail can be **LEFT** ( $-\infty,-a$ ), **CENTER**  $[-a,a]$  or **RIGHT**  $(a, \infty)$  for Real  $a$ .

See also **invNorm(**.

## LEFT

## RIGHT

## CENTER

NORMAL FLOAT AUTO REAL RADIAN MP	NORMAL FLOAT AUTO REAL RADIAN MP	NORMAL FLOAT AUTO REAL RADIAN MP
CATALOG LabelOff LabelOn Lbl lcm( ▶LEFT length( Line( LinReg(a+bx) LinReg(ax+b)	CATALOG ref( remainder( Repeat Return ▶RIGHT round( *row( row+( *row+( ▶CENTER	CATALOG binomcdf( binompdf( BorderColor Boxplot ▶CENTER checkTmr( χ <sup>2</sup> cdf( χ <sup>2</sup> pdf( χ <sup>2</sup> -Test( A

**invT(****invT**(*area,df*)

[2nd] [DISTR]

Computes the inverse cumulative student-t probability function specified by degree of freedom, *df* for a given area under the curve.

 DISTR  
 4:invT(
**iPart(****iPart**(*value*)

[MATH]

Returns the integer part of a real or complex number, expression, list, or matrix.

 NUM  
 3:iPart(
**irr(****irr**(*CF0,CFList[,CFFreq]*)

[APPS]

Returns the interest rate at which the net present value of the cash flow is equal to zero.

 1:Finance  
 CALC  
 8:irr(
**isClockOn****isClockOn**

[2nd]

Identifies if clock is ON or OFF. Returns 1 if the clock is ON. Returns 0 if the clock is OFF.

 [CATALOG]  
 isClockOn
**IS>(****:IS>**(*variable,value*)

+ [PRGM]

**:commandA**

CTL

**:commands**

A:IS&gt;(

Increments *variable* by 1; skips *commandA* if *variable*>*value*.

**L****L****L***listname*

[2nd] [LIST]

Identifies the next one to five characters as a user-created list name.

 OPS  
 B: L
**LabelOff****LabelOff**

+ [2nd] [FORMAT]

## LabelOff

Turns off axes labels.

LabelOff

## LabelOn

LabelOn

+ [2nd] [FORMAT]

Turns on axes labels.

LabelOn

## Lbl

Lbl *label*

+ [PRGM]

Creates a *label* of one or two characters.

CTL

9:Lbl

## lcm(

lcm(*valueA*,*valueB*)

[MATH]

Returns the least common multiple of *valueA* and *valueB*, which can be real numbers or lists.

NUM

8:lcm(

## length(

length(*string*)

[2nd]

Returns the number of characters in *string*.

[CATALOG]

length(

## Line(

Line(*X1*,*Y1*,*X2*,*Y2* [,*erase#*,*color#*,*linestyle#*])

[2nd] [DRAW]

Draws a line from (*X1*,*Y1*) to (*X2*,*Y2*) with the following options:  
erase #: 1,0, color #: 10-24, and line style #: 1-4.

DRAW

2:Line(

## Line(

Line(*X1*,*Y1*,*X2*,*Y2*,0 [,*line#*])

[2nd] [DRAW]

Erases a line (erase #: 1,0) from (*X1*,*Y1*) to (*X2*,*Y2*).

DRAW

2:Line(

### LinReg(a+bx)

**LinReg(a+bx)** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

Fits a linear regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**[STAT]**  
**CALC**  
**8:LinReg**  
**(a+bx)**

### LinReg(ax+b)

**LinReg(ax+b)** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

Fits a linear regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**[STAT]**  
**CALC**  
**4:LinReg**  
**(ax+b)**

### LinRegTInt

**LinRegTInt** [*Xlistname*,*Ylistname*,*freqlist*,*confidence level*, *regequ*]

Performs a linear regression and computes the t confidence interval for the slope coefficient b.

**+ [STAT]**  
**TESTS**  
**G:LinRegTInt**

### LinRegTTest

**LinRegTTest**  
[*Xlistname*,*Ylistname*,*freqlist*,*alternative*,*regequ*]

Performs a linear regression and a *t*-test. *alternative*=-1 is <; *alternative*=0 is =; *alternative*=1 is >.

**+ [STAT]**  
**TESTS**  
**F:LinRegTTest**

### ΔList(

**ΔList(list)**

Returns a list containing the differences between consecutive elements in *list*.

**[2nd] [LIST]**  
**OPS**  
**7: Δ List(**

### List→matr(

**List→matr(listname1,...,listname n,matrixname)**

Fills *matrixname* column by column with the elements from each specified *listname*.

**[2nd] [LIST]**  
**OPS**  
**0>List → matr**  
**(**

## In(

**In**(*value*)

**LN**

Returns the natural logarithm of a real or complex number, expression, or list.

## LnReg

**LnReg** [*Xlistname*, *Ylistname*, *freqlist*, *regequ*]

**STAT**

**CALC**

**9:LnReg**

Fits a logarithmic regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

## log(

**log**(*value*)

**LOG**

Returns logarithm of a real or complex number, expression, or list.

## logBASE(

**logBASE**(*value*, *base*)

**MATH**

Returns the logarithm of a specified value determined from a specified base:  $\text{logBASE}(\text{value}, \text{base})$ .

**A: logBASE**

## Logistic

**Logistic** [*Xlistname*, *Ylistname*, *freqlist*, *regequ*]

**CALC**

**B:Logistic**

Fits a logistic regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

# M

## Manual-Fit

**Manual-Fit** $[eqname,color\#,line\ style\#]$

**[STAT]**

Fits a linear equation to a scatter plot with specified color and line style.

**CALC**

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**D:Manual-Fit**

line style #: 1-4.

## MATHPRINT

**MATHPRINT**

**[MODE]**

Displays most entries and answers the way they are displayed in

textbooks, such as  $\frac{1}{2} + \frac{3}{4}$ .

**MATHPRINT**

## Matr▶list(

**Matr▶list** $(matrix,listnameA,...,listname\ n)$

**[2nd] [LIST]**

Fills each *listname* with elements from each column in *matrix*.

**OPS**

**A:Matr▶ list(**

## Matr▶list(

**Matr▶list** $(matrix,column\#,listname)$

**[2nd] [LIST]**

Fills a *listname* with elements from a specified *column#* in *matrix*.

**OPS**

**A:Matr▶ list (**

## max(

**max** $(valueA,valueB)$

**[MATH]**

Returns the larger of *valueA* and *valueB*.

**NUM**

**7:max(**

## max(

**max** $(list)$

**[MATH]**

Returns the larger of *valueA* and *valueB*.

**NUM**

**7:max(**

**max(****max(list)****2nd** **[LIST]**Returns largest real or complex element in *list*.**MATH**  
**2:max(****max(****max(listA,listB)****2nd** **[LIST]**Returns a real or complex list of the larger of each pair of elements in *listA* and *listB*.**MATH**  
**2:max(****max(****max(value,list)****2nd** **[LIST]**Returns a real or complex list of the larger of *value* or each *list* element.**MATH**  
**2:max(****mean(****mean(list[,freqlist])****2nd** **[LIST]**Returns the mean of *list* with frequency *freqlist*.**MATH**  
**3:mean(****median(****median(list[,freqlist])****2nd** **[LIST]**Returns the median of *list* with frequency *freqlist*.**MATH**  
**4:median(****Med-Med****Med-Med [Xlistname,Ylistname,freqlist,regu]****[STAT]**Fits a median-median model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regu*.**CALC**  
**3:Med-Med****Menu(****Menu("title","text1",label1[,...,"text7",label7])****+ [PRGM]**

Generates a menu of up to seven items during program execution.

**CTL**  
**C:Menu(****min(****min(valueA,valueB)****[MATH]**



## min(

Returns smaller of *valueA* and *valueB*.

NUM  
6:min(

## min(

**min**(*list*)

**2nd** [LIST]

Returns smallest real or complex element in *list*.

MATH  
1:min(

## min(

**min**(*listA*,*listB*)

**2nd** [LIST]

Returns real or complex list of the smaller of each pair of elements in *listA* and *listB*.

MATH  
1:min(

## min(

**min**(*value*,*list*)

**2nd** [LIST]

Returns a real or complex list of the smaller of *value* or each *list* element.

MATH  
1:min(

## ModBoxplot

**ModBoxplot** Plot#(*type*,*Xlist*,[*freqlist*,*color*#])

+ **2nd**  
[stat plot]

Used as the "type" argument in the command.

Where # gives Plot1, Plot2 or Plot3.

TYPE

## N

## nCr

*valueA* **nCr** *valueB*

[MATH]

Returns the number of combinations of *valueA* taken *valueB* at a time.

PRB  
3:nCr

**nCr***value nCr list***MATH**Returns a list of the combinations of *value* taken each element in *list* at a time.**PRB**  
**3:nCr****nCr***list nCr value***MATH**Returns a list of the combinations of each element in *list* taken *value* at a time.**PRB**  
**3:nCr****nCr***listA nCr listB***MATH**Returns a list of the combinations of each element in *listA* taken each element in *listB* at a time.**PRB**  
**3:nCr****n/d****n/d****ALPHA** [F1]

Displays results as a simple fraction.

**1: n/d**  
or**MATH****NUM**  
**D: n/d**  
or**MATH****FRAC**  
**1:n/d**

## nDeriv(

**nDeriv**(*expression,variable,value[, $\epsilon$ ]*)

When command is used in Classic mode, returns approximate numerical derivative of *expression* with respect to *variable* at *value*, with specific tolerance  $\epsilon$ .

In MathPrint mode, numeric derivative template pastes and uses default tolerance  $\epsilon$ .

**MATH**

**MATH**

**8:nDeriv(**

## ► n/d ◄► Un/d

► n/d ◄► Un/d

Converts the results from a fraction to mixed number or from a mixed number to a fraction, if applicable.

**ALPHA** [F1]

**3: ► n/d ◄►**

**Un/d**

or

**MATH**

**NUM**

**A: ► n/d ◄►**

**Un/d**

or

**MATH**

**FRAC**

**4: ► n/d ◄**

**►Un/d**

## ►Nom(

►Nom(*effective rate, compounding periods*)

Computes the nominal interest rate.

**APPS** 1:Finance

**CALC**

**B: ► Nom(**

## Normal

**Normal**

Sets normal display mode.

+ **MODE**

**Normal**

## normalcdf(

**normalcdf**(*lowerbound*,*upperbound*[, $\mu$ , $\sigma$ ])

 [DISTR]

DISTR

Computes the normal distribution probability between *lowerbound* and *upperbound* for the specified  $\mu$  and  $\sigma$ .

2:normalcdf(

## normalpdf(

**normalpdf**(*x*[, $\mu$ , $\sigma$ ])

 [DISTR]

DISTR

Computes the probability density function for the normal distribution at a specified *x* value for the specified  $\mu$  and  $\sigma$ .

1:normalpdf(

## NormProbPlot

**NormProbPlot** Plot#(*type*,*Xlist*[,*freqlist*,*color*#])

+ 

[stat plot]

Used as the "type" argument in the command

TYPE

Where # gives Plot1, Plot2 or Plot3.

## not(

**not**(*value*)

 [TEST]

LOGIC

Returns 0 if *value* is 0. *value* can be a real number, expression, or list.

4:not(

## nPr

*valueA* nPr *valueB*



PRB

Returns the number of permutations of *valueA* taken *valueB* at a time.

2:nPr

## nPr

*value* nPr *list*



PRB

Returns a list of the permutations of *value* taken each element in *list* at a time.

2:nPr

## nPr

*list* nPr *value*



PRB

Returns a list of the permutations of each element in *list* taken *value* at a time.

2:nPr

## nPr

*listA* nPr *listB*

**MATH**

Returns a list of the permutations of each element in *listA* taken each element in *listB* at a time.

**PRB**  
**2:nPr**

## npv(

npv(*interest rate*,*CF0*,*CFList*[],*CFFreq*)

**APPS**

Computes the sum of the present values for cash inflows and outflows.

**1:Finance**  
**CALC**  
**7:npv(**

## O

### OpenLib(

OpenLib(

+ **PRGM**

Extends TI-Basic. (Not available.)

**CTL**  
**J:OpenLib**  
**(**

## or

*valueA* or *valueB*

**2nd** **[TEST]**

Returns 1 if *valueA* or *valueB* is 0. *valueA* and *valueB* can be real numbers, expressions, or lists.

**LOGIC**  
**2:or**

### Output(

Output(*row*,*column*,"*text*")

+ **PRGM**

Displays *text* beginning at specified *row* and *column* of the home screen.

**I/O**  
**6:Output(**

### Output(

Output(*row*,*column*,*value*)

+ **PRGM**

Displays *value* beginning at specified *row* and *column* of the home screen.

**I/O**  
**6:Output(**

## P

### Param

Param

+ **MODE**

**Par**

## Param

Sets parametric graphing mode.

## Pause

### Pause

↑ [PRGM]

CTL

Suspends program execution until you press [ENTER].

8:Pause

## Pause

### Pause [*value*]

↑ [PRGM]

CTL

Displays *value*; suspends program execution until you press [ENTER].

8:Pause

## Pause

### Pause [*value, time*]

↑ [PRGM]

CTL

Displays *value* on the current home screen and execution of the program continues after the time period specified. For time only, use Pause "",*time* where the value is a blank string. Time is in seconds.

8:Pause

Pause *value,time*.

## Plot1( Plot2( Plot3(

### Plot#(*type,Xlist,Ylist,mark,color#*)

↑ [2nd]

[STAT PLOT]

Defines Plot # (1, 2, or 3) of *type* Scatter or xyLine for *Xlist* and *Ylist* using *mark* and *color*.

STAT PLOTS

Color#: 10 - 24 or color name pasted from [vars] COLOR.

1:Plot1

2:Plot2

**Note:** *Xlist* and *Ylist* represent the Xlist and Ylist names.

3:Plot3

## Plot1( Plot2( Plot3(

### Plot#(*type,Xlist,[freqlist,color#*)

↑ [2nd]

[STAT PLOT]

Defines Plot # (1, 2, or 3) of *type* Histogram or Boxplot for *Xlist* with frequency *freqlist* and *color* #.

STAT PLOTS

Color#: 10 - 24 or color name pasted from [vars] COLOR.

1:Plot1

2:Plot2

**Note:** *Xlist* represents the Xlist name.

3:Plot3

## Plot1( Plot2( Plot3(

**Plot#**(*type,Xlist,[freqlist,mark,color#]*)

Defines **Plot #** (1, 2, or 3) of *type* **ModBoxplot** for *Xlist* with frequency *freqlist* using *mark* and *color #*.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**Note:** *Xlist* represents the Xlist name.

+ [2nd]  
[STAT PLOT]  
STAT PLOTS  
1:Plot1  
2:Plot2  
3:Plot3

## Plot1( Plot2( Plot3(

**Plot#**(*type,datalist,[data axis,mark,color#]*)

Defines **Plot #** (1, 2, or 3) of *type* **NormProbPlot** for *datalist* on *data axis* using *mark* and *color #* *data axis* can be **X** or **Y**.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**Note:** *datalist* represents the datalist name.

+ [2nd]  
[STAT PLOT]  
STAT PLOTS  
1:Plot1  
2:Plot2  
3:Plot3

## PlotsOff

**PlotsOff** [1,2,3]

Deselects all stat plots or one or more specified stat plots (1, 2, or 3).

[2nd]  
[STAT PLOT]  
STAT  
PLOTS  
4:PlotsOff

## PlotsOn

**PlotsOn** [1,2,3]

Selects all stat plots or one or more specified stat plots (1, 2, or 3).

[2nd]  
[STAT PLOT]  
STAT  
PLOTS  
5:PlotsOn

## Pmt\_Bgn

**Pmt\_Bgn**

Specifies an annuity due, where payments occur at the beginning of each payment period.

[APPS]  
1:Finance  
CALC  
F:Pmt\_Bgn

## Pmt\_End

### Pmt\_End

Specifies an ordinary annuity, where payments occur at the end of each payment period.

**[APPS]**

1:Finance  
CALC  
E:Pmt\_End

## poissoncdf(

### poissoncdf( $\mu, x$ )

Computes a cumulative probability at  $x$  for the discrete Poisson distribution with specified mean  $\mu$ .

**[2nd] [DISTR]**

DISTR

D:poissoncdf  
(

## poissonpdf(

### poissonpdf( $\mu, x$ )

Computes a probability at  $x$  for the discrete Poisson distribution with the specified mean  $\mu$ .

**[2nd] [DISTR]**

DISTR

C:poissonpdf  
(

## Polar

### Polar

Sets polar graphing mode.

+ **[MODE]**

Polar

## ►Polar

### *complex value* ►Polar

Displays *complex value* in polar format.

**[MATH]**

CMPLX

7: ► Polar

## PolarGC

### PolarGC

Sets polar graphing coordinates format.

+ **[2nd]**

**[FORMAT]**

PolarGC

## prgm

### prgmname

+ **[PRGM]**



**prgm**

Executes the program *name*.

CTRL  
D:prgm

 **$\Sigma$ Prn(**

$\Sigma$ Prn(*pmt1*,*pmt2* [,*roundvalue*])

Computes the sum, rounded to *roundvalue*, of the principal amount between *pmt1* and *pmt2* for an amortization schedule.

[APPS]  
1:Finance  
CALC  
0:  $\Sigma$  Prn(

**prod(**

prod(*list* [,*start*,*end*])

Returns product of *list* elements between *start* and *end*

[2nd] [LIST]  
MATH  
6:prod(

**Prompt**

Prompt *variableA* [,*variableB*, ..., *variable n*]

Prompts for value for *variableA*, then *variableB*, and so on.

+ [PRGM]  
I/O  
2:Prompt

**1-PropZInt(**

1-PropZInt(*x*,*n* [,*confidence level*])

Computes a one-proportion *z* confidence interval.

+ [STAT]  
TESTS  
A:1-PropZInt(

**2-PropZInt(**

2-PropZInt(*x1*,*n1*,*x2*,*n2* [,*confidence level*])

Computes a two-proportion *z* confidence interval.

+ [STAT]  
TESTS  
B:2-PropZInt(

**1-PropZTest(**

1-PropZTest(*p0*,*x*,*n* [,*alternative*,*drawflag*, *color#*])

Computes a one-proportion *z* test. *alternative*=-1 is <; *alternative*=0 is  
; *alternative*=1 is >. *drawflag*=1 draws results; *drawflag*=0  
calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ [STAT]  
TESTS  
5:1-PropZTest  
(

## 2-PropZTest(

**2-PropZTest**( $x1,n1,x2,n2$ [,*alternative*,*drawflag*, *color*#])

+ [STAT]

TESTS

6:2-PropZTest

Computes a two-proportion  $z$  test. *alternative*=-1 is <; *alternative*=0 is ; *alternative*=1 is >. *drawflag*=1 draws results; *drawflag*=0 calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Pt-Change(

**Pt-Change**( $x,y$ [,*color*#])

[2nd] [DRAW]

POINTS

3:Pt-Change(

Toggles a point on or off at ( $x,y$ ) on the graph area. Off will be in the Background color and On will be the specified

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Pt-Off(

**Pt-Off**( $x,y$ [,*mark*])

[2nd] [DRAW]

POINTS

2:Pt-Off(

Erases a point at ( $x,y$ ) on the graph area using *mark*. The Off state may be the background color determined by the *ImageVar* or *color* setting.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Pt-On(

**Pt-On**( $x,y$ [,*mark*,*color*#])

[2nd] [DRAW]

POINTS

1:Pt-On(

Draws a point at ( $x,y$ ) on the graph area using *mark* and the specified *color*#.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## PwrReg

**PwrReg** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

[STAT]

CALC

A:PwrReg

Fits a power regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**Pxl-Change(****Pxl-Change**(*row,column[,color#]*)**2nd** [DRAW]

POINTS

Toggles Off to On in the graph area: with specified *color#*

Toggles On to Off in the graph area: Off will display the set Background Image Var or Color.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**6:Pxl-Change**

(

**Pxl-Off(****Pxl-Off**(*row,column*)**2nd** [DRAW]

POINTS

The Off state will display the set Background Image Var or COLOR.

**5:Pxl-Off(****Pxl-On(****Pxl-On**(*row,column[,color#]*)**2nd** [DRAW]

POINTS

Draws pixel on the graph area at (*row,column*) in the specified color.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**4:Pxl-On(****pxl-Test(****pxl-Test**(*row,column*)**2nd** [DRAW]

POINTS

Returns 1 if pixel (*row,column*) is on, 0 if it is off;**7:pxl-Test(****P►Rx(****P►Rx**(*r,θ*)**2nd** [ANGLE]

ANGLE

Returns X, given polar coordinates *r* and *θ* or a list of polar coordinates.**7:P►Rx(****P►Ry(****P►Ry**(*r,θ*)**2nd** [ANGLE]

ANGLE

Returns Y, given polar coordinates *r* and *θ* or a list of polar coordinates.**8:P►Ry(**

## Q

### QuadReg

**QuadReg** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

**STAT**

Fits a quadratic regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**CALC**  
**5:QuadReg**

### QuartReg

**QuartReg** [*Xlistname*,*Ylistname*,*freqlist*,*regequ*]

**STAT**

Fits a quartic regression model to *Xlistname* and *Ylistname* with frequency *freqlist*, and stores the regression equation to *regequ*.

**CALC**  
**7:QuartReg**

## R

### Radian

**Radian**

† **MODE**

Sets radian angle mode.

**Radian**

### rand

**rand**(*numtrials*)

**MATH**

Returns a random number between 0 and 1 for a specified number of trials *numtrials*.

**PRB**  
**1:rand**

### randBin(

**randBin**(*numtrials*,*prob*[,*numsimulations*])

**MATH**

Generates and displays a random real number from a specified Binomial distribution.

**PRB**  
**7:randBin(**

## randInt(

**randInt(** *lower,upper* [,*numtrials*])

Generates and displays a random integer within a range specified by *lower* and *upper* integer bounds for a specified number of trials *numtrials*.

**[MATH]**

**PRB**

**5:randInt(**

## randIntNoRep(

**randIntNoRep(** *lowerint,upperint* [,*numelements*])

Returns a random ordered list of integers from a lower integer to an upper integer which may include the lower integer and upper integer. If the optional argument *numelements* is specified, the first *numelements* are listed. The first *numelements* term in the list of random integers are displayed.

**[MATH]**

**PRB**

**8:randIntNoRep(**

## randM(

**randM(** *rows,columns*)

Returns a random matrix of *rows* × *columns*.

Max rows x columns = 400 matrix elements.

**[2nd]**

**[MATRIX]**

**MATH**

**6:randM(**

## randNorm(

**randNorm(**  $\mu,\sigma$  [,*numtrials*])

Generates and displays a random real number from a specified Normal distribution specified by  $\mu$  and  $\sigma$  for a specified number of trials *numtrials*.

**[MATH]**

**PRB**

**6:randNorm(**

## $re^{\theta i}$

$re^{\theta i}$

Sets the mode to polar complex number mode ( $re^{\theta i}$ ).

**+ [MODE]**

**$re^{\theta i}$**

## Real

**Real**

Sets mode to display complex results only when you enter complex numbers.

**+ [MODE]**

**Real**

## real(

**real**(*value*)

Returns the real part of a complex number or list of complex numbers.

**[MATH]**

**CPLX**

**2:real(**

## RecallGDB

**RecallGDB** *n*

Restores all settings stored in the graph database variable **GDB***n*.

**[2nd] [DRAW]**

**STO**

**4:RecallGDB**

## RecallPic

**RecallPic** *n*

Displays the graph and adds the picture stored in **Pic***n*.

**[2nd] [DRAW]**

**STO**

**2:RecallPic**

## ►Rect

*complex value* ►**Rect**

Displays *complex value* or list in rectangular format.

**[MATH]**

**CMPLX**

**6:► Rect**

## RectGC

**RectGC**

Sets rectangular graphing coordinates format.

**+ [2nd]**

**[FORMAT]**

**RectGC**

## ref(

**ref**(*matrix*)

Returns the row-echelon form of a *matrix*.

**[2nd]**

**[MATRIX]**

**MATH**

**A:ref(**

## remainder(

**remainder**(*dividend*, *divisor*)

Reports the remainder as a whole number from a division of two whole numbers where the divisor is not zero.

**[MATH]**

**NUM**

**0:remainder(**

## remainder(

**remainder**(*list*, *divisor*)

**[MATH]**

**NUM**

Reports the remainder as a whole number from a division of two lists where the divisor is not zero.

**0:remainder(**

## remainder(

**remainder**(*dividend*, *list*)

**[MATH]**

**NUM**

Reports the remainder as a whole number from a division of two whole numbers where the divisor is a list.

**0:remainder(**

## remainder(

**remainder**(*list*, *list*)

**[MATH]**

**NUM**

Reports the remainder as a whole number from a division of two lists.

**0:remainder  
(**

## Repeat

**Repeat***condition:commands:End:commands*

† **[PRGM]**

**CTL**

Executes *commands* until *condition* is true.

**6:Repeat**

## Return

**Return**

† **[PRGM]**

**CTL**

Returns to the calling program.

**E:Return**

## round(

**round**(*value*[,*#decimals*])

**[MATH]**

**NUM**

Returns a number, expression, list, or matrix rounded to *#decimals* ( 9).

**2:round(**

## \*row(

**\*row**(*value*,*matrix*,*row*)

**[2nd] [MATRIX]**

**MATH**

Returns a matrix with *row* of *matrix* multiplied by *value* and stored in *row*.

**E: \* row(**

**row+**(**row+**(*matrix,rowA,rowB*)Returns a matrix with *rowA* of *matrix* added to *rowB* and stored in *rowB*.[2nd] [MATRIX]  
MATH  
D:row+**\*row+**(**\*row+**(*value,matrix,rowA,rowB*)Returns a matrix with *rowA* of *matrix* multiplied by *value*, added to *rowB*, and stored in *rowB*.[2nd] [MATRIX]  
MATH  
F: \* row+**rowSwap**(**rowSwap**(*matrix,rowA,rowB*)Returns a matrix with *rowA* of *matrix* swapped with *rowB*.[2nd] [MATRIX]  
MATH  
C:rowSwap**rref**(**rref**(*matrix*)Returns the reduced row-echelon form of a *matrix*.[2nd] [MATRIX]  
MATH  
B:rref**R►Pr**(**R►Pr**(*x,y*)Returns **R**, given rectangular coordinates *x* and *y* or a list of rectangular coordinates.[2nd] [ANGLE]  
ANGLE  
5:R ► Pr**R►Pθ**(**R►Pθ**(*x,y*)Returns **θ**, given rectangular coordinates *x* and *y* or a list of rectangular coordinates.[2nd] [ANGLE]  
ANGLE  
6:R ► P θ



**2-SampFTest****2-SampFTest**

[  
*listname1*

,  
*listname2*

*freqlist1,freqlist2,alternative,drawflag,color#*]

Performs a two-sample  $F$  test. *alternative=-1* is  $<$ ; *alternative=0* is  $=$ ; *alternative=1* is  $>$ . *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ [STAT]

TESTS

E:2-Samp F Test

**2-SampFTest****2-SampFTest***Sx1,n1,Sx2,n2*

[*,alternative,drawflag,color#*]

Performs a two-sample  $F$  test. *alternative=-1* is  $<$ ; *alternative=0* is  $=$ ; *alternative=1* is  $>$ . *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ [STAT]

TESTS

E:2-Samp F Test

**2-SampTInt****2-SampTInt**

[*listname1,listname2,freqlist1,freqlist2,confidence level,pooled*]

(Data list input)

Computes a two-sample  $t$  confidence interval. *pooled=1* pools variances; *pooled=0* does not pool variances.

+ [STAT]

TESTS

O:2-SampTInt

**2-SampTInt****2-SampTInt** $\bar{x}1,Sx1,n1,\bar{x}2,Sx2,n2$ [*,confidence*

*level,pooled*]

(Summary stats input)

Computes a two-sample  $t$  confidence interval. *pooled=1* pools variances; *pooled=0* does not pool variances.

+ [STAT]

TESTS

O:2-SampTInt

## 2-SampTTest

### 2-SampTTest

```
[  
  listname1  
,  
  listname2  
,  
  freqlist1  
  freqlist2,alternative,pooled,drawflag,color#])
```

Computes a two-sample  $t$  test. *alternative=-1* is  $<$ ; *alternative=0* is  $=$ ; *alternative=1* is  $>$ . *pooled=1* pools variances; *pooled=0* does not pool variances. *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ **STAT**

TESTS

4:2-SampTTest

## 2-SampTTest

```
2-SampTTest  $\bar{x}1, Sx1, n1, v2, Sx2, n2$   
[,alternative,pooled,drawflag,color#])
```

Computes a two-sample  $t$  test. *alternative=-1* is  $<$ ; *alternative=0* is  $=$ ; *alternative=1* is  $>$ . *pooled=1* pools variances; *pooled=0* does not pool variances. *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ **STAT**

TESTS

4:2-SampTTest

## 2-SampZInt(

```
2-SampZInt( $\sigma_1, \sigma_2$   
[,listname1,listname2,freqlist1,freqlist2,confidence  
level])  
(Data list input)
```

Computes a two-sample  $z$  confidence interval.

+ **STAT**

TESTS

9:2-SampZInt(

## 2-SampZInt(

```
2-SampZInt( $\sigma_1, \sigma_2, \bar{x}1, n1, \bar{x}2, n2$  [,confidence level])  
(Summary stats input)
```

Computes a two-sample  $z$  confidence interval.

+ **STAT**

TESTS

9:2-SampZInt(

## 2-SampZTest(

**2-SampZTest**( $\sigma_1, \sigma_2$   
[,  
*listname1*  
,  
*listname2*  
*freqlist1, freqlist2, alternative, drawflag, color#*)

Computes a two-sample  $z$  test. *alternative=-1* is <; *alternative=0* is  
; *alternative=1* is >. *drawflag=1* draws results; *drawflag=0*  
calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ **[STAT]**

**TESTS**

**3:2-SampZTest(**

## 2-SampZTest(

**2-SampZTest**( $\sigma_1, \sigma_2, \bar{x}_1, n_1, \bar{x}_2, n_2$   
[,*alternative, drawflag, color#*)

Computes a two-sample  $z$  test. *alternative=-1* is <; *alternative=0* is  
; *alternative=1* is >. *drawflag=1* draws results; *drawflag=0*  
calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

+ **[STAT]**

**TESTS**

**3:2-SampZTest(**

## Scatter

**Scatter** Plot#(*type, Xlist, [freqlist, color#*)

Used as the "type" argument in the command

Where # gives Plot1, Plot2 or Plot3.

+ **[2nd]** **[stat plot]**

**TYPE**

## Sci

**Sci**

Sets scientific notation display mode.

+ **[MODE]**

**Sci**

## Select(

**Select**(*Xlistname, Ylistname*)

Selects one or more specific data points from a scatter plot or xyLine  
plot (only), and then store's the selected data points to two new  
lists, *Xlistname* and *Ylistname*.

**[2nd]** **[LIST]**

**OPS**

**8:Select(**

## Send(

**Send**(*string*)

† **PRGM**  
I/O  
B:Send(

Sends one or more TI-Innovator™ Hub commands to a connected hub.

### Notes:

- See also [eval\(](#) and [Get\(](#) command related to the Send( command.
- TI-Innovator™ Hub commands are supported in the HUB submenu in the CE OS v.5.2 program editor.

## Send(

TI-  
Innovator™  
Hub

**Send**(*string*)

† **PRGM**  
HUB

Sends one or more TI-Innovator™ Hub commands to a connected hub.

### Notes:

- See also [eval\(](#) and [Get\(](#) command related to the Send( command.
- TI-Innovator™ Hub commands are supported in the HUB submenu in the CE OS v.5.2 program editor.

See menu  
location  
depending  
on TI-  
Innovator  
Hub sensors.

## seq(

**seq**(*expression,variable,begin,end[,increment]*)

**2nd** **[LIST]**  
OPS  
5:seq(

Returns list created by evaluating *expression* with regard to *variable*, from *begin* to *end* by *increment*.

## SEQ(*n*)

**Seq**(*n*)

† **MODE**

In sequence mode, **SEQ(*n*)** sets the sequence editor type to enter sequence functions, u, v, or w, as a function of the independent variable *n*. Can also be set from the Y= editor in **SEQ mode**.

**SEQ(*n*)**

## SEQ(*n*+1)

**Seq**(*n*+1)

† **MODE**

In sequence mode, **SEQ(*n*+1)** sets the sequence editor type to enter sequence functions, u, v, or w, as a function of the independent variable *n*+1. Can also be set from the Y= editor in **SEQ mode**.

**SEQ(*n*+1)**

## SEQ( $n+2$ )

### Seq( $n+2$ )

+ [MODE]

In sequence mode, **SEQ( $n+2$ )** sets the sequence editor type to enter sequence functions, u, v, or w, as a function of the independent variable  $n+2$ . Can also be set from the Y= editor in **SEQ mode**.

SEQ( $n+2$ )

```
NORMAL FLOAT AUTO REAL RADIAN MP
CATALOG
Send(
seq(
Seq
▶SEQ(n) Type
SEQ(n+1) Type
SEQ(n+2) Type
Sequential
setDate(
setDtFmt(
```

Note: "Type" will NOT be included in the TIC CE PE syntax

On the device, "Type" does not paste and is similar to how the device displays, for example, DEC Answers where Answers appears in [catalog] but does not paste.

## Seq

### Seq

+ [MODE]

Sets sequence graphing mode.

Seq

## Sequential

### Sequential

+ [MODE]

Sets mode to graph functions sequentially.

Sequential

## setDate(

### setDate(*year,month,day*)

[2nd] [CATALOG]

Sets the date using a year, month, day format. The *year* must be 4 digits; *month* and *day* can be 1 or 2 digit.

setDate(

## setDtFmt(

### setDtFmt(*integer*)

[2nd]

Sets the date format.

[CATALOG]

- 1 = M/D/Y
- 2 = D/M/Y
- 3 = Y/M/D

setDtFmt(

## setTime(

**setTime**(*hour,minute, second*)

**2nd** [CATALOG]

**setTime**(

Sets the time using an hour, minute, second format. The *hour* must be in 24 hour format, in which 13 = 1 p.m.

## setTmFmt(

**setTmFmt**(*integer*)

**2nd** [CATALOG]

**setTmFmt**(

Sets the time format.

12 = 12 hour format

24 = 24 hour format

## SetUpEditor

**SetUpEditor**

**STAT**

**EDIT**

**5:SetUpEditor**

Removes all list names from the stat list editor, and then restores list names **L1** through **L6** to columns **1** through **6**.

## SetUpEditor

**SetUpEditor** *listname1[,listname2,...,listname20]*

**STAT**

**EDIT**

**5:SetUpEditor**

Removes all list names from the stat list editor, then sets it up to display one or more *listnames* in the specified order, starting with column **1**.

## Shade(

**Shade**(*lowerfunc,upperfunc*  
*[,Xleft,Xright,pattern,patres,color#]*)

**2nd** [DRAW]

**DRAW**

**7:Shade**(

Draws *lowerfunc* and *upperfunc* in terms of **X** on the current graph and uses *pattern* and *patres* to shade and color the area bounded by *lowerfunc*, *upperfunc*, *Xleft*, and *Xright*. *lowerfunc* and *upperfunc* are shaded in the same specified color.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Shade $\chi^2$ (

**Shade $\chi^2$ (*lowerbound*,*upperbound*,*df*[,*color#*])**

**2nd** [DISTR]

**DRAW**

Draws the density function for the  $\chi^2$  distribution specified by degrees of freedom *df*, and shades and colors the area between *lowerbound* and *upperbound*.

**3:Shade  $\chi^2$  (**

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## ShadeF(

**ShadeF(*lowerbound*,*upperbound*,*numerator df*,*denominator df*[,*color#*])**

**2nd** [DISTR]

**DRAW**

**4:Shade F (**

Draws the density function for the F distribution specified by *numerator df* and *denominator df* and shades and colors the area between *lowerbound* and *upperbound*.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## ShadeNorm(

**ShadeNorm(*lowerbound*,*upperbound* [,  $\mu$ ,  $\sigma$ , *color#*])**

**2nd** [DISTR]

**DRAW**

**1:ShadeNorm(**

Draws the normal density function specified by  $\mu$  and  $\sigma$  and shades and colors the area between *lowerbound* and *upperbound*.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Shade\_t(

**Shade\_t(*lowerbound*,*upperbound*,*df*[,*color#*])**

**2nd** [DISTR]

**DRAW**

**2:Shade\_t(**

Draws the density function for the Student-t distribution specified by degrees of freedom *df*, and shades or colors the area between *lowerbound* and *upperbound*.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Simul

### Simul

+ **MODE****Simul**

Sets mode to graph functions simultaneously.

## sin(

### sin(*value*)

**SIN**

Returns the sine of a real number, expression, or list.

## $\sin^{-1}$ (

### $\sin^{-1}$ (*value*)

**2nd** **SIN<sup>-1</sup>**

Returns the arcsine of a real number, expression, or list.

## sinh(

### sinh(*value*)

**2nd** **CATALOG****sinh(**

Returns the hyperbolic sine of a real number, expression, or list.

## $\sinh^{-1}$ (

### $\sinh^{-1}$ (*value*)

**2nd** **CATALOG** **$\sinh^{-1}$  (**

Returns the hyperbolic arcsine of a real number, expression, or list.

## SinReg

### SinReg

**STAT**

[*iterations*,*Xlistname*,*Ylistname*,*period*,*regequ*]

**CALC****C:SinReg**

Attempts *iterations* times to fit a sinusoidal regression model to *Xlistname* and *Ylistname* using a *period* guess, and stores the regression equation to *regequ*.



## **solve(**

**solve**(*expression,variable,guess,{lower,upper}*)

Solves *expression* for *variable*, given an initial *guess* and *lower* and *upper* bounds within which the solution is sought.

+ [MATH]  
MATH  
0:solve(

## **SortA(**

**SortA**(*listname*)

Sorts elements of *listname* in ascending order.

[2nd] [LIST]  
OPS  
1:SortA(

## **SortA(**

**SortA**(*keylistname,dependlist 1*  
[,*dependlist 2,...,dependlist n*])

Sorts elements of *keylistname* in ascending order, then sorts each *dependlist* as a dependent list.

[2nd] [LIST]  
OPS  
1:SortA(

## **SortD(**

**SortD**(*listname*)

Sorts elements of *listname* in descending order.

[2nd] [LIST]  
OPS  
2:SortD(

## **SortD(**

**SortD**(*keylistname,dependlist 1[,dependlist 2,...,*  
*dependlist n*])

Sorts elements of *keylistname* in descending order, then sorts each *dependlist* as a dependent list.

[2nd] [LIST]  
OPS  
2:SortD(

## **startTmr**

**startTmr**

Starts the clock timer. Store or note the displayed value, and use it as the argument for **checkTmr()** to check the elapsed time.

[2nd] [CATALOG]  
startTmr

## STATWIZARD OFF

### STATWIZARD OFF

Disables wizard syntax help for statistical commands, distributions, and seq{.

**2nd** [CATALOG]  
STATWIZARD  
OFF

## STATWIZARD ON

### STATWIZARD ON

Enables wizard syntax help for statistical commands, distributions, and seq{.

**2nd** [CATALOG]  
STATWIZARD  
ON{

## stdDev{

### stdDev(*list*{,*freqlist*})

Returns the standard deviation of the elements in *list* with frequency *freqlist*.

**2nd** [LIST]  
MATH  
7:stdDev{

## Stop

### Stop

Ends program execution; returns to home screen.

+ **PRGM**  
CTL  
F:Stop

## Store →

### Store: *value*→*variable*

Stores *value* in *variable*.

**STO**→

## StoreGDB

### StoreGDB *n*

Stores current graph in database **GDB***n*.

**2nd** [DRAW]  
STO  
3:StoreGDB

## StorePic

**StorePic** *n*

Stores current picture in picture **Pic***n*.

**2nd** **[DRAW]**  
**STO**  
**1:StorePic**

## String→Equ(

**String→Equ**(*string*,**Y=** *var*)

Converts *string* into an equation and stores it in **Y=** *var*.

*string* can be a string or string variable.

**String→Equ** is the inverse of **Equ→String**(.

**†** **[PRGM]**  
**I/O**  
**F:String→Equ(**

## sub(

**sub**(*string*,*begin*,*length*)

Returns a string that is a subset of another *string*, from *begin* to *length*.

**2nd** **[CATALOG]**  
**sub(**

## sum(

**sum**(*list*[,*start*,*end*])

Returns the sum of elements of *list* from *start* to *end*.

**2nd** **[LIST]**  
**MATH**  
**5:sum(**

## summation $\Sigma$ (

$\Sigma$ (*expression*[,*start*,*end*])

Classic command as shown.

In MathPrint™ the summation entry template displays and returns the sum of elements of *list* from *start* to *end*, where *start*  $\leq$  *end*.

**[MATH]**  
**NUM**  
**0: summation  $\Sigma$ (**

## T

## tan(

**tan**(*value*)

Returns the tangent of a real number, expression, or list.

**[TAN]**

**$\tan^{-1}()$**

**$\tan^{-1}(\text{value})$**

[2nd] [TAN<sup>-1</sup>]

Returns the arctangent of a real number, expression, or list.

**Tangent()**

**Tangent(*expression,value[,color#,linestyle#]*)**

[2nd] [DRAW]

DRAW

Draws a line tangent to *expression* at  $X=\text{value}$  with specified *color#*: 10-24 and line style *linestyle #*: 1-2.

5:Tangent()

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**tanh()**

**tanh(*value*)**

[2nd]

Returns hyperbolic tangent of a real number, expression, or list.

[CATALOG]

tanh()

**$\tanh^{-1}()$**

**$\tanh^{-1}(\text{value})$**

[2nd]

Returns the hyperbolic arctangent of a real number, expression, or list.

[CATALOG]

$\tanh^{-1}()$

**tcdf()**

**tcdf(*lowerbound,upperbound,df*)**

[2nd] [DISTR]

DISTR

Computes the Student-*t* distribution probability between *lowerbound* and *upperbound* for the specified degrees of freedom *df*.

6:tcdf()

**Text()**

**Text(*row,column,text1,text2,...,text n*)**

[2nd] [DRAW]

DRAW

Writes *text* on graph beginning at pixel (*row,column*), where 0 *row* 164 and 0 *column* 264.

0:Text()

Full mode, row must be  $\leq 148$ ; column must be 256

Horiz mode, row must be  $\text{row} \leq 66$  and column must be  $\leq 256$

G-T mode, row must be  $\text{row} \leq 126$ ; column must be 176

**TextColor()**

**TextColor(*[color#]*)**

+ [2nd]

## TextColor(

Set text color prior to using the **Text(** command.

[DRAW]

Color#: 10 - 24 or color name pasted from [vars] COLOR.

DRAW

A:TextColor  
(

## Then

**Then**

*See If:Then*

## Thick

**Thick**

+ [MODE]

Resets all Y=editor line-style settings to Thick.

Thick

## Thin

**Thin**

+ [MODE]

Resets all Y=editor line-style settings to Thin.

Thin

## Time

**Time**

+ [2nd]

Sets sequence graphs to plot with respect to time.

[FORMAT]

Time

## timeCnv(

**timeCnv**(*seconds*)

[2nd] [CATALOG]

Converts seconds to units of time that can be more easily understood for evaluation. The list is in *{days, hours, minutes, seconds}* format.

timeCnv

## TInterval

**TInterval** [*listname, freqlist, confidence level*]  
(Data list input)

+ [STAT]

TESTS

Computes a *t* confidence interval.

8:TInterval

## Interval

**Interval**  $\bar{x}, Sx, n, [confidence\ level]$   
(Summary stats input)

+ [STAT]  
TESTS

Computes a *t* confidence interval.

8:Interval

## toString()

**toString()**(*value*[,*format*])

+ [PRGM]  
I/O

Converts value to a string where *value* can be real, complex, an evaluated expression, list, or matrix. String *value* displays in classic *format* (0) following the mode setting AUTO/DEC or in decimal *format* (1).

E:toString()

## tpdf()

**tpdf()**(*x*,*df*)

[2nd] [DISTR]  
DISTR

Computes the probability density function (pdf) for the Student-*t* distribution at a specified *x* value with specified degrees of freedom *df*.

5:tpdf()

## Trace

**Trace**

[TRACE]

Displays the graph and enters **TRACE** mode.

## T-Test

**T-Test**  $\mu 0$   
[,*listname*,*freqlist*,*alternative*,*drawflag*,*color#*])  
(Data list input)

+ [STAT]  
TESTS  
2:T-Test

Performs a *t* test with frequency *freqlist*. *alternative*=-1 is <; *alternative*=0 is ; *alternative*=1 is >. *drawflag*=1 draws results; *drawflag*=0 calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## T-Test

**T-Test**  $\mu 0, \bar{x}, Sx, n, [alternative, drawflag, color\#]$

+ [STAT]  
TESTS  
2:T-Test

Performs a *t* test with frequency *freqlist*. *alternative*=-1 is <; *alternative*=0 is ; *alternative*=1 is >. *drawflag*=1 draws results; *drawflag*=0 calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## tvm\_FV

tvm\_FV[(N,I%,PV,PMT,P/Y,C/Y)]

Computes the future value.

[APPS]

1:Finance  
CALC  
6:tvm\_FV

## tvm\_I%

tvm\_I%[(N,PV,PMT,FV,P/Y,C/Y)]

Computes the annual interest rate.

[APPS]

1:Finance  
CALC  
3:tvm\_  
I%

## tvm\_N

tvm\_N[(I%,PV,PMT,FV,P/Y,C/Y)]

Computes the number of payment periods.

[APPS]

1:Finance  
CALC  
5:tvm\_N

## tvm\_Pmt

tvm\_Pmt[(N,I%,PV,FV,P/Y,C/Y)]

Computes the amount of each payment.

[APPS]

1:Finance  
CALC  
2:tvm\_  
Pmt

## tvm\_PV

tvm\_PV[(N,I%,PMT,FV,P/Y,C/Y)]

Computes the present value.

[APPS]

1:Finance  
CALC  
4:tvm\_PV

## U

### UnArchive

UnArchive *variable*

Moves the specified variables from the user data archive memory to RAM.

To archive variables, use **Archive**.

[2nd] [MEM]

6:UnArchive

## Un/d

### Un/d

Displays results as a mixed number, if applicable.

**[MATH]**  
NUM  
C: Un/d

or

**[MATH]**  
FRAC  
2:Un/d

## uvAxes

### uvAxes

Sets sequence graphs to plot  $u(n)$  on the x-axis and  $v(n)$  on the y-axis.

+ **[2nd]**  
**[FORMAT]**  
uv

## uwAxes

### uwAxes

Sets sequence graphs to plot  $u(n)$  on the x-axis and  $w(n)$  on the y-axis.

+ **[2nd]**  
**[FORMAT]**  
uw

## V

## 1-VarStats

### 1-VarStats [*Xlistname*,*freqlist*]

Performs one-variable analysis on the data in *Xlistname* with frequency *freqlist*.

**[STAT]**  
CALC  
1:1-Var Stats

## 2-VarStats

### 2-VarStats [*Xlistname*,*Ylistname*,*freqlist*]

Performs two-variable analysis on the data in *Xlistname* and *Ylistname* with frequency *freqlist*.

**[STAT]**  
CALC  
2:2-Var Stats

## variance(

### variance(*list*[,*freqlist*])

Returns the variance of the elements in *list* with frequency *freqlist*.

**[2nd]** **[LIST]**  
MATH  
8:variance(



## Vertical

**Vertical**  $x$ ,*color#*,*linestyle#*

**[2nd] [DRAW]**

Draws a vertical line at  $x$  with specified color and line style.

**DRAW**

Color#: 10 - 24 or color name pasted from [vars] COLOR.

**4:Vertical**

line style #: 1-4.

## vwAxes

**vwAxes**

+ **[2nd]**

**[FORMAT]**

Sets sequence graphs to plot  $v(n)$  on the  $x$ -axis and  $w(n)$  on the  $y$ -axis.

**vw**

## W

### Wait

**Wait***time*

+ **[PRGM]**

**CTL**

Suspends execution of a program for a given time. Maximum time is 100 seconds.

**A:Wait**

### Wait

**TI-  
Innovator™  
Hub**

**Wait***time*

+ **[PRGM]**

**HUB**

Suspends execution of a program for a given time. Maximum time is 100 seconds.

**4:Wait**

### Web

**Web**

+ **[2nd]**

**[FORMAT]**

Sets sequence graphs to trace as webs.

**Web**

### :While

**:While***condition:commands*

+ **[PRGM]**

**:End:command**

**CTL**

Executes *commands* while *condition* is true.

**5:While**

## X

### xor

*valueA* xor *valueB*

**2nd** [TEST]

Returns 1 if only *valueA* or *valueB* = 0. *valueA* and *valueB* can be real numbers, expressions, or lists.

LOGIC

3:xor

### xyLine

**xyLine** Plot#(*type*,*Xlist*,[*freqlist*,*color*#])

†

Used as the "type" argument in the command

**2nd**

Where # gives Plot1, Plot2 or Plot3.

[stat plot]

TYPE

## Z

### ZBox

**ZBox**

† **ZOOM**

Displays a graph, lets you draw a box that defines a new viewing window, and updates the window.

ZOOM

1:ZBox

### ZDecimal

**ZDecimal**

† **ZOOM**

Adjusts the viewing window so that **TraceStep=0.1**,  **$\Delta X=0.5$**  and  **$\Delta Y=0.5$** , and displays the graph screen with the origin centered on the screen.

ZOOM

4:ZDecimal

### ZFrac1/2

**ZFrac1/2**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{2}$ , if possible. Sets **TraceStep** to  $\frac{1}{2}$  and  **$\Delta X$**  and  **$\Delta Y$**  to  $\frac{1}{4}$ .

ZOOM

B:ZFrac1/2

### ZFrac1/3

**ZFrac1/3**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{3}$ , if possible. Sets **TraceStep** to  $\frac{1}{3}$  and  **$\Delta X$**  and  **$\Delta Y$**  to  $\frac{1}{6}$ .

ZOOM

C:ZFrac1/3

## ZFrac1/4

### ZFrac1/4

**ZOOM**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{4}$ , if possible. Sets **TraceStep** to  $\frac{1}{4}$  and  $\Delta X$  and  $\Delta Y$  to  $\frac{1}{8}$ .

**D:ZFrac1/4**

## ZFrac1/5

### ZFrac1/5

**ZOOM**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{5}$ , if possible. Sets **TraceStep** to  $\frac{1}{5}$  and  $\Delta X$  and  $\Delta Y$  to  $\frac{1}{10}$ .

**E:ZFrac1/5**

## ZFrac1/8

### ZFrac1/8

**ZOOM**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{8}$ , if possible. Sets **TraceStep** to  $\frac{1}{8}$  and  $\Delta X$  and  $\Delta Y$  to  $\frac{1}{16}$ .

**F:ZFrac1/8**

## ZFrac1/10

### ZFrac1/10

**ZOOM**

**ZOOM**

Sets the window variables so that you can trace in increments of  $\frac{1}{10}$ , if possible. Sets **TraceStep** to  $\frac{1}{10}$  and  $\Delta X$  and  $\Delta Y$  to  $\frac{1}{20}$ .

**G:ZFrac1/10**

## ZInteger

### ZInteger

† **ZOOM**

**ZOOM**

Redefines the viewing window using the following dimensions:

**TraceStep=1,  $\Delta X=0.5$ , Xscl=10,  $\Delta Y=1$ , Yscl=10.**

**8:ZInteger**

## ZInterval

**ZInterval** $\sigma$ [,*listname*,*freqlist*,*confidence level*]  
(Data list input)

+ [STAT]  
TESTS

Computes a  $z$  confidence interval.

7:ZInterval

## ZInterval

**ZInterval** $\sigma$ , $\bar{x}$ , $n$ [,*confidence level*]  
(Summary stats input)

+ [STAT]  
TESTS

Computes a  $z$  confidence interval.

7:ZInterval

## Zoom In

**Zoom In**

+ [ZOOM]

Magnifies the part of the graph that surrounds the cursor location.

ZOOM

2:Zoom In

## Zoom Out

**Zoom Out**

+ [ZOOM]

Displays a greater portion of the graph, centered on the cursor location.

ZOOM

3:Zoom Out

## ZoomFit

**ZoomFit**

+ [ZOOM]

Recalculates **Ymin** and **Ymax** to include the minimum and maximum **Y** values, between **Xmin** and **Xmax**, of the selected functions and replots the functions.

ZOOM

0:ZoomFit

## ZoomRcl

**ZoomRcl**

+ [ZOOM]

Graphs the selected functions in a user-defined viewing window.

MEMORY

3:ZoomRcl

## ZoomStat

### ZoomStat

Redefines the viewing window so that all statistical data points are displayed.

† **ZOOM**  
**ZOOM**  
**9:ZoomStat**

## ZoomSto

### ZoomSto

Immediately stores the current viewing window.

† **ZOOM**  
**MEMORY**  
**2:ZoomSto**

## ZPrevious

### ZPrevious

Replots the graph using the window variables of the graph that was displayed before you executed the last **ZOOM** instruction.

† **ZOOM**  
**MEMORY**  
**1:ZPrevious**

## ZQuadrant1

### ZQuadrant1

Displays the portion of the graph that is in quadrant 1.

**ZOOM**  
**ZOOM**  
**A:ZQuadrant1**

## ZSquare

### ZSquare

Adjusts the **X** or **Y** window settings so that each pixel represents an equal width and height in the coordinate system, and updates the viewing window.

† **ZOOM**  
**ZOOM**  
**5:ZSquare**

## ZStandard

### ZStandard

Replots the functions immediately, updating the window variables to the default values.

† **ZOOM**  
**ZOOM**  
**6:ZStandard**

## Z-Test(

**Z-Test**( $\mu$ , $\sigma$   
[,*listname*,*freqlist*,*alternative*,*drawflag*,*color*#])  
(Data list input)

Performs a *z* test with frequency *freqlist*. *alternative*= -1 is <;

† **STAT**  
**TESTS**  
**1:Z-Test(**

## Z-Test(

*alternative=0* is ; *alternative=1* is >. *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## Z-Test(

**Z-Test( $\mu$ , $\sigma$ , $\bar{X}$ , $n$ [,*alternative*,*drawflag*,*color#*])**  
**(Summary stats input)**

+ **STAT**  
**TESTS**

**1:Z-Test(**

Performs a *z* test. *alternative=-1* is <; *alternative=0* is ; *alternative=1* is >. *drawflag=1* draws results; *drawflag=0* calculates results.

Color#: 10 - 24 or color name pasted from [vars] COLOR.

## ZTrig

**ZTrig**

+ **ZOOM**  
**ZOOM**  
**7:ZTrig**

Replots the functions immediately, updating the window variables to preset values for plotting trig functions.

# Arithmetic Operations, Test Relations, and Symbols

## ! (factorial)

**Factorial:** *value*!

Returns factorial of *value*.

**[MATH]**

**PRB**

**4:!**

## ! (factorial)

**Factorial:** *list*!

Returns factorial of *list* elements.

**[MATH]**

**PRB**

**4:!**

## ° (degrees notation)

**Degrees notation:** *value*°

Interprets *value* as degrees; designates degrees in DMS format.

**[2nd] [ANGLE]**

**ANGLE**

**1: °**

## ⸀ (radian)

**Radian:** *angle*⸀

Interprets *angle* as radians.

**[2nd] [ANGLE]**

**ANGLE**

**3:⸀**

## T (transpose)

**Transpose:** *matrix*<sup>T</sup>

Returns a matrix in which each element (row, column) is swapped with the corresponding element (column, row) of *matrix*.

**[2nd] [MATRIX]**

**MATH**

**2: T**

## $x\sqrt{\phantom{x}}$

$x^{\text{th}}\text{root}\mathbf{x}\sqrt{\text{value}}$

Returns  $x^{\text{th}}\text{root}$  of *value*.

**[MATH]**

**MATH**

**5:  $x\sqrt{\phantom{x}}$**

## $x\sqrt{\phantom{x}}$

$x^{\text{th}}\text{root}\mathbf{x}\sqrt{\text{list}}$

**[MATH]**

$x\sqrt{\quad}$ Returns  $x^{\text{th}}$  root of *list* elements.

MATH

5:  $x\sqrt{\quad}$  $x\sqrt{\quad}$  $listx\sqrt{value}$ 

MATH

Returns *list* roots of *value*.

MATH

5:  $x\sqrt{\quad}$  $x\sqrt{\quad}$  $listA x\sqrt{listB}$ 

MATH

Returns *listA* roots of *listB*.

MATH

5:  $x\sqrt{\quad}$ **3 (cube)****Cube:**  $value^3$ 

MATH

Returns the cube of a real or complex number, expression, list, or square matrix.

MATH

3: 3

 $\sqrt[3]{\quad}$  (cube root)**Cube root:**  $\sqrt[3]{(value)}$ 

MATH

Returns the cube root of a real or complex number, expression, or list.

MATH

4: 3 (

**= (equal)****Equal:**  
 $valueA=valueB$ 

2nd [TEST]

TEST

Returns 1 if  $valueA = valueB$ . Returns 0 if  $valueA \neq valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers, expressions, lists, or matrices.

1: =



### $\neq$ (not equal)

**Not equal:**

$$valueA \neq valueB$$

**2nd** [TEST]

TEST

2:  $\neq$

Returns 1 if  $valueA \neq valueB$ . Returns 0 if  $valueA = valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers,  
expressions, lists, or matrices.

### $<$ (less than)

**Less than:**

$$valueA < valueB$$

**2nd** [TEST]

TEST

5:  $<$

Returns 1 if  $valueA < valueB$ . Returns 0 if  $valueA \geq valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers,  
expressions, or lists.

### $>$ (greater than)

**Greater than:**

$$valueA > valueB$$

**2nd** [TEST]

TEST

3:  $>$

Returns 1 if  $valueA > valueB$ . Returns 0 if  $valueA \leq valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers,  
expressions, or lists.

### $\leq$ (less or equal)

**Less than or equal:**

$$valueA \leq valueB$$

**2nd** [TEST]

TEST

6:  $\leq$

Returns 1 if  $valueA \leq valueB$ . Returns 0 if  $valueA > valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers,  
expressions, or lists.

### $\geq$ (greater or equal)

**Greater than or equal:**

$$valueA \geq valueB$$

**2nd** [TEST]

TEST

4:  $\geq$

Returns 1 if  $valueA \geq valueB$ . Returns 0 if  $valueA < valueB$ .  
 $valueA$  and  $valueB$  can be real or complex numbers,  
expressions, or lists.

### $^{-1}$ (inverse)

**Inverse:**  $value^{-1}$

**x<sup>-1</sup>**

Returns 1 divided by a real or complex number or expression.

## $^{-1}$ (inverse)

Inverse:  $list^{-1}$

$x^{-1}$

Returns 1 divided by *list* elements.

## $^{-1}$ (inverse)

Inverse:  $matrix^{-1}$

$x^{-1}$

Returns *matrix* inverted.

## 2 (square)

Square:  $value^2$

$x^2$

Returns *value* multiplied by itself. *value* can be a real or complex number or expression.

## 2 (square)

Square:  $list^2$

$x^2$

Returns *list* elements squared.

## 2 (square)

Square:  $matrix^2$

$x^2$

Returns *matrix* multiplied by itself.

## ^ (power)

Powers:  $value^{power}$

$x^{\wedge}$

Returns *value* raised to *power*. *value* can be a real or complex number or expression.

## ^ (power)

Powers:  $list^{power}$

$x^{\wedge}$

Returns *list* elements raised to *power*.

### **^ (power)**

**Powers:**  $value^{list}$



Returns  $value$  raised to  $list$  elements.

### **^ (power)**

**Powers:**  $matrix^{power}$



Returns  $matrix$  elements raised to  $power$ .

### **- (negation)**

**Negation:**  $-value$



Returns the negative of a real or complex number, expression, list, or matrix.

### **10^( (power of ten)**

**Power of ten:**  $10^{(value)}$



Returns 10 raised to the  $value$  power.  $value$  can be a real or complex number or expression.

### **10^( (power of ten)**

**Power of ten:**  $10^{(list)}$



Returns a list of 10 raised to the  $list$

### **√( (square root)**

**Square root:**  $\sqrt{(value)}$



Returns square root of a real or complex number, expression, or list.

### **\* (multiply)**

**Multiplication:**  
 $valueA * valueB$



Returns  $valueA$  times  $valueB$ .

### **\* (multiply)**

**Multiplication:**



**\* (multiply)** $value * list$ 

Returns  $value$  times each  $list$  element.

**\* (multiply)****Multiplication:** $list * value$ 

Returns each  $list$  element times  $value$ .

**\* (multiply)****Multiplication:** $listA * listB$ 

Returns  $listA$  elements times  $listB$  elements.

**\* (multiply)****Multiplication:** $value * matrix$ 

Returns value times  $matrix$  elements.

**\* (multiply)****Multiplication:** $matrixA * matrixB$ 

Returns  $matrixA$  times  $matrixB$ .

**/ (divide)****Division:**  $valueA / valueB$ 

Returns  $valueA$  divided by  $valueB$

**/ (divide)****Division:**  $list / value$ 

Returns  $list$  elements divided by value.

**/ (divide)****Division:**  $value / list$ 

### / (divide)

Returns value divided by *list* elements.

### / (divide)

**Division:**  $listA/listB$



Returns *listA* elements divided by *listB* elements.

### + (add)

**Addition:**  $valueA+valueB$



Returns *valueA* plus *valueB*.

### + (add)

**Addition:**  $list+value$



Returns list in which *value* is added to each *list* element.

### + (add)

**Addition:**  $listA+listB$



Returns *listA* elements plus *listB* elements.

### + (add)

**Addition:**  
 $matrixA+matrixB$



Returns *matrixA* elements plus *matrixB* elements.

**+ (concatenation)**

**Concatenation:**  
 $string1 + string2$



Concatenates two or more strings.

**- (subtract)**

**Subtraction:**  
 $valueA - valueB$



Subtracts  $valueB$  from  $valueA$ .

**- (subtract)**

**Subtraction:**  
 $value - list$



Subtracts  $list$  elements from  $value$

**- (subtract)**

**Subtraction:**  
 $list - value$



Subtracts  $value$  from  $list$  elements.

**- (subtract)**

**Subtraction:**  
 $listA - listB$



Subtracts  $listB$  elements from  $listA$  elements.

**- (subtract)**

**Subtraction:**  
 $matrixA - matrixB$



Subtracts  $matrixB$  elements from  $matrixA$  elements.

' (minutes notation)

Minutes notation:  $\text{degrees}^\circ \text{minutes}'$   
 $\text{seconds}''$

**2nd** [ANGLE]  
ANGLE  
2:'

Interprets *minutes* angle measurement as minutes.

" (seconds notation)

Seconds notation:  
 $\text{degrees}^\circ \text{minutes}' \text{seconds}''$

**ALPHA** ["]

Interprets *seconds* angle measurement as seconds.

# Error Messages

When the TI-84 Plus CE detects an error, it returns an error message as a menu title, such as **ERR:SYNTAX** or **ERR:DOMAIN**. This table contains each error type, possible causes, and suggestions for correction. The error types listed in this table are each preceded by **ERR:** on your graphing calculator display. For example, you will see **ERR:ARCHIVED** as a menu title when your graphing calculator detects an **ARCHIVED** error type.

ERROR TYPE	Possible Causes and Suggested Remedies
<b>ARCHIVED</b>	You have attempted to use, edit, or delete an archived variable. For example, the expression <code>dim(L1)</code> produces an error if L1 is archived.
<b>ARCHIVE FULL</b>	You have attempted to archive a variable and there is not enough space in archive to receive it.
<b>ARGUMENT</b>	A function or instruction does not have the correct number of arguments.  The arguments are shown in italics. The arguments in brackets are optional and you need not type them. You must also be sure to separate multiple arguments with a comma (,). For example, <code>stdDev(list[,freqlist])</code> might be entered as <code>stdDev(L1)</code> or <code>stdDev(L1,L2)</code> since the frequency list or <i>freqlist</i> is optional.
<b>BAD ADDRESS</b>	You have attempted to send or receive an application and an error (e.g. electrical interference) has occurred in the transmission.
<b>BAD GUESS</b>	In a <b>CALC</b> operation, you specified a <b>Guess</b> that is not between <b>Left Bound</b> and <b>Right Bound</b> .  For the <code>solve(</code> function or the equation solver, you specified a <i>guess</i> that is not between <i>lower</i> and <i>upper</i> .  Your guess and several points around it are undefined.  Examine a graph of the function. If the equation has a solution, change the bounds and/or the initial guess.
<b>BOUND</b>	In a <b>CALC</b> operation or with <code>Select(</code> , you defined <b>Left Bound &gt; Right Bound</b> .  In <code>fMin(</code> , <code>fMax(</code> , <code>solve(</code> , or the equation solver, you entered <i>lower upper</i> .
<b>BREAK</b>	You pressed the <code>ON</code> key to break execution of a program, to halt a <b>DRAW</b> instruction, or to stop evaluation of an expression.
<b>DATA TYPE</b>	You entered a value or variable that is the wrong data type. For a function (including implied multiplication) or an instruction, you entered an argument that is an invalid data type, such as a complex number where a real number is



ERROR TYPE	Possible Causes and Suggested Remedies
	<p>required.</p> <p>In an editor, you entered a type that is not allowed, such as a matrix entered as an element in the stat list editor.</p> <p>You attempted to store an incorrect data type, such as a matrix, to a list.</p> <p>You attempted to enter complex numbers into the n/d MathPrint™ template.</p>
<b>DIMENSION MISMATCH</b>	<p>Your calculator displays the <b>ERR:DIMENSION MISMATCH</b> error if you are trying to perform an operation that references one or more lists or matrices whose dimensions do not match. For example, multiplying <math>L1 * L2</math>, where <math>L1 = \{1,2,3,4,5\}</math> and <math>L2 = \{1,2\}</math> produces an <b>ERR:DIMENSION MISMATCH</b> error because the number of elements in <math>L1</math> and <math>L2</math> do not match.</p> <p>You may need to turn Plots Off to continue.</p>
<b>DIVIDE BY 0</b>	<p>You attempted to divide by zero. This error is not returned during graphing. The TI-84 Plus CE allows for undefined values on a graph.</p> <ul style="list-style-type: none"> <li>You attempted a linear regression with a vertical line.</li> </ul>
<b>DOMAIN</b>	<p>You specified an argument to a function or instruction outside the valid range. The TI-84 Plus CE allows for undefined values on a graph.</p> <p>You attempted a logarithmic or power regression with a <math>-X</math> or an exponential or power regression with a <math>-Y</math>.</p> <p>You attempted to compute <math>\Sigma Prn(</math> or <math>\Sigma Int(</math> with <math>pmt2 &lt; pmt1</math>.</p>
<b>DUPLICATE</b>	<p>You attempted to create a duplicate group name.</p>
<b>Duplicate Name</b>	<p>A variable you attempted to transmit cannot be transmitted because a variable with that name already exists in the receiving unit.</p>
<b>EXPIRED</b>	<p>You have attempted to run an application with a limited trial period which has expired.</p>
<b>Error in Xmit</b>	<p>The TI-84 Plus CE was unable to transmit an item. Check to see that the cable is firmly connected to both units and that the receiving unit is in receive mode.</p> <p>You pressed <math>\overline{ON}</math> to break during transmission.</p> <p>Setup RECEIVE first and then SEND, when sending files (<math>\overline{LINK}</math>) between graphing calculators.</p>
<b>ID NOT FOUND</b>	<p>This error occurs when the SendID command is executed but the proper graphing calculator ID cannot be found.</p>
<b>ILLEGAL NEST</b>	<p>You attempted to use an invalid function in an argument to a function, such as <math>seq(</math> within <i>expression</i> for <math>seq(</math>.</p>

ERROR TYPE	Possible Causes and Suggested Remedies
<b>INCREMENT</b>	<p>The increment, step, in <b>seq(</b> is 0 or has the wrong sign. . The TI-84 Plus CE allows for undefined values on a graph.</p> <p>The increment in a <b>For(</b> loop is 0.</p>
<b>INVALID</b>	<p>You attempted to reference a variable or use a function where it is not valid. For example, <b>Yn</b> cannot reference <b>Y</b>, <b>Xmin</b>, <b><math>\Delta X</math></b>, or <b>TblStart</b>.</p> <p>In <b>Seq</b> mode, you attempted to graph a phase plot without defining both equations of the phase plot.</p> <p>In <b>Seq</b> mode, you attempted to graph a recursive sequence without having input the correct number of initial conditions.</p> <p>In <b>Seq</b> mode, you attempted to reference terms other than <b>(n-1)</b> or <b>(n-2)</b>.</p> <p>You attempted to designate a graph style that is invalid within the current graph mode.</p> <p>You attempted to use <b>Select(</b> without having selected (turned on) at least one xyLine or scatter plot.</p>
<b>INVALID DIMENSION</b>	<p>The <b>ERR:INVALID DIMENSION</b> error message may occur if you are trying to graph a function that does not involve the stat plot features. The error can be corrected by turning off the stat plots. To turn the stat plots off, press <b>[2nd] [STAT PLOT]</b> and then select <b>4:PlotsOff</b>.</p> <p>You specified a list dimension as something other than an integer between 1 and 999.</p> <p>You specified a matrix dimension as something other than an integer between 1 and 99.</p> <p>You attempted to invert a matrix that is not square.</p>
<b>ITERATIONS</b>	<p>The <b>solve(</b> function or the equation solver has exceeded the maximum number of permitted iterations. Examine a graph of the function. If the equation has a solution, change the bounds, or the initial guess, or both.</p> <p><b>irr(</b> has exceeded the maximum number of permitted iterations.</p> <p>When computing <b>I%</b>, the maximum number of iterations was exceeded.</p>
<b>LABEL</b>	<p>The label in the <b>Goto</b> instruction is not defined with a <b>Lbl</b> instruction in the program.</p>
<b>LINK L1 (or any other file) to Restore</b>	<p>The calculator has been disabled for testing. To restore full functionality, use TI Connect™ CE software to download a file to your calculator from your computer, or transfer any file to your calculator from another TI-84 Plus CE.</p>
<b>MEMORY</b>	<p>Memory is insufficient to perform the instruction or function. You must delete items from memory before executing the</p>

ERROR TYPE	Possible Causes and Suggested Remedies
	<p>instruction or function.</p> <p>Recursive problems return this error; for example, graphing the equation <math>Y1=Y1</math>.</p> <p>Branching out of an <b>If/Then</b>, <b>For</b>(, <b>While</b>, or <b>Repeat</b> loop with a <b>Goto</b> also can return this error because the <b>End</b> statement that terminates the loop is never reached.</p> <p>Attempting to create a matrix with larger than 400 cells.</p>
<b>MemoryFull</b>	<p>You are unable to transmit an item because the receiving unit's available memory is insufficient. You may skip the item or exit receive mode.</p> <p>During a memory backup, the receiving unit's available memory is insufficient to receive all items in the sending unit's memory. A message indicates the number of bytes the sending unit must delete to do the memory backup. Delete items and try again.</p>
<b>MODE</b>	<p>You attempted to store to a window variable in another graphing mode or to perform an instruction while in the wrong mode; for example, <b>DrawInv</b> in a graphing mode other than <b>Func</b>.</p>
<b>NO SIGN CHANGE</b>	<p>The <b>solve</b>( function or the equation solver did not detect a sign change.</p> <p>You attempted to compute <b>I%</b> when <b>FV</b>, (<b>N PMT</b>), and <b>PV</b> are all 0, or when <b>FV</b>, (<b>N PMT</b>), and <b>PV</b> are all 0.</p> <p>You attempted to compute <b>irr</b>( when neither <b>CFList</b> nor <b>CFO</b> is &gt; 0, or when neither <b>CFList</b> nor <b>CFO</b> is &lt; 0.</p>
<b>NONREAL ANSWERS</b>	<p>In <b>Real</b> mode, the result of a calculation yielded a complex result. . The TI-84 Plus CE allows for undefined values on a graph.</p>
<b>OVERFLOW</b>	<p>You attempted to enter, or you have calculated, a number that is beyond the range of the graphing calculator. The TI-84 Plus CE allows for undefined values on a graph.</p>
<b>RESERVED</b>	<p>You attempted to use a system variable inappropriately.</p>
<b>SINGULAR MATRIX</b>	<p>A singular matrix (determinant = 0) is not valid as the argument for <b>-1</b>.</p> <p>The <b>SinReg</b> instruction or a polynomial regression generated a singular matrix (determinant = 0) because the algorithm could not find a solution, or a solution does not exist.</p> <p>The TI-84 Plus CE allows for undefined values on a graph.</p>
<b>SINGULARITY</b>	<p><i>expression</i> in the <b>solve</b>( function or the equation solver contains a singularity (a point at which the function is not defined). Examine a graph of the function. If the equation has a solution, change the bounds or the initial guess or both.</p>

ERROR TYPE	Possible Causes and Suggested Remedies
<b>STAT</b>	<p>You attempted a stat calculation with lists that are not appropriate.</p> <p>Statistical analyses must have at least two data points.</p> <p><b>Med-Med</b> must have at least three points in each partition.</p> <p>When you use a frequency list, its elements must be 0. <math>(X_{\max} - X_{\min}) / X_{\text{sc1}}</math> must be between 0 and 131 for a histogram.</p>
<b>STAT PLOT</b>	<p>You attempted to display a graph when a stat plot that uses an undefined list is turned on.</p>
<b>SYNTAX</b>	<p>The command contains a syntax error. Look for misplaced functions, arguments, parentheses, or commas.</p> <p>For example, <b>stdDev</b>(<i>list</i>[<i>freqlist</i>]) is a function of the TI-84 Plus CE. The arguments are shown in italics. The arguments in brackets are optional and you need not type them. You must also be sure to separate multiple arguments with a comma (.). For example <b>stdDev</b>(<i>list</i>[<i>freqlist</i>]) might be entered as <b>stdDev</b>(L1) or <b>stdDev</b>(L1,L2) since the frequency list or <i>freqlist</i> is optional.</p>
<b>TOLERANCE NOT MET</b>	<p>You requested a tolerance to which the algorithm cannot return an accurate result.</p>
<b>UNDEFINED</b>	<p>You referenced a variable that is not currently defined. For example, you referenced a stat variable when there is no current calculation because a list has been edited, or you referenced a variable when the variable is not valid for the current calculation, such as <b>a</b> after <b>Med-Med</b>.</p>
<b>VALIDATION</b>	<p>Electrical interference caused a link to fail or this graphing calculator is not authorized to run the application.</p>
<b>VARIABLE</b>	<p>You have tried to archive a variable that cannot be archived or you have tried to unarchive an application or group.</p> <p>Examples of variables that cannot be archived include:</p> <p>Real numbers <b>LRESID</b>, <b>R</b>, <b>T</b>, <b>X</b>, <b>Y</b>, <b>Theta</b>, Statistic variables under <b>Vars</b>, <b>STATISTICS</b> menu, <b>Yvars</b>, and the <b>AppldList</b>.</p>
<b>VERSION</b>	<p>You have attempted to receive an incompatible variable version from another graphing calculator.</p> <p>A program may contain commands not supported in the OS version on your graphing calculator. Always use the latest OS. TI-84 Plus CE and TI-84 Plus share programs but a version error will be given if any new TI-84 Plus CE programs may need to be adjusted for the high resolution graph area.</p>
<b>WINDOW RANGE</b>	<p>A problem exists with the window variables.</p> <p>You defined <b>Xmax Xmin</b> or <b>Ymax Ymin</b>.</p>

ERROR TYPE	Possible Causes and Suggested Remedies
<b>ZOOM</b>	<p>You defined <math>\theta_{\max}</math> <math>\theta_{\min}</math> and <math>\theta_{\text{step}} &gt; 0</math> (or vice versa).            You attempted to define <math>T_{\text{step}}=0</math>.            You defined <math>T_{\max}</math> <math>T_{\min}</math> and <math>T_{\text{step}} &gt; 0</math> (or vice versa).            Window variables are too small or too large to graph correctly. You may have attempted to zoom to a point that exceeds the TI-84 Plus CE's numerical range.</p> <p>A point or a line, instead of a box, is defined in <b>ZBox</b>.            A <b>ZOOM</b> operation returned a math error.</p>

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