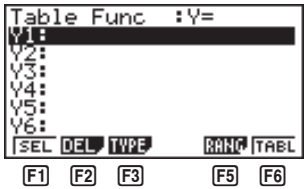
Chapter 15

Table & Graph

With Table & Graph, you can generate tables of discreet data from functions and recursion formulas, and then use the values for graphing. Because of this, Table & Graph makes it easy to grasp the nature of numeric tables and recursion formulas.

15-1 Before Using Table & Graph

First select the **TABLE** icon on the Main Menu and then enter the TABLE Mode. When you do, the table function list appears on the display.



- F1 (SEL) ..... Numeric table generation/non-generation status
- F2 (DEL) ..... Function delete
- F3 (TYPE) ..... Function type specification
- F5 (RANG) .... Table range specification screen
- F6 (TABL) ..... Start numeric table generation

- Note that the item for function key F5 (RANG) does not appear when a list name is specified for the Variable item in the set up screen.

15-2 Storing a Function and Generating a Numeric Table

●To store a function

Example **To store the function $y = 3x^2 - 2$ in memory area Y1**

Use ▲ and ▼ to move the highlighting in the TABLE Mode function list to the memory area where you want to store the function. Next, input the function and press [EXE] to store it.

■ Variable Specifications

There are two methods you can use to specify value for the variable x when generating a numeric table.

• Table range method

With this method, you specify the conditions for the change in value of the variable.

• List

With this method, you substitute the values contained in a previously created list for the value of the variable.

●To generate a table using a table range

Example **To generate a table as the value of variable x change from –3 to 3, in increments of 1**

[F5](RANG)
[→] [3] [EXE] [3] [EXE] [1] [EXE]

The numeric table range defines the conditions under which the value of variable x changes during function calculation. The following is the meaning of each of the numeric table range parameters.

Start ..... Variable x start value
End ..... Variable x end value
pitch ..... Variable x value change

After specifying the table range, press [EXIT] to return to the function list.

●To generate a table using a list

Example **To generate a table using the values in List 6**

[SHIFT] [SETUP]

[F1] [F2]

- If the highlighting is not located at the Variable item, use ▲ and ▼ to move it there.

[F2](LIST) [F6](List6)

After specifying the list you want to use, press [EXIT] to return to the previous screen.

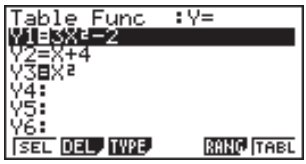
- Note that the RANG item for function key [F5] of the TABLE Menu function list does not appear when a list name is specified for the Variable item of the set up screen.

■ Generating a Table

Example **To generate a table of values for the functions stored in memory areas Y1 and Y3 of the TABLE Mode function list**

Use ▲ and ▼ to move the highlighting to the function you want to select for table generation and press [F1] (SEL) to select it.

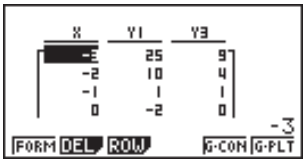
The "=" sign of selected functions are highlighted on the screen. To deselect a function, move the cursor to it and press [F1] (SEL) again.



[F6]

Press [F6] (TABL) or [EXE] to generate a numeric table using the functions you selected. The value of variable *x* changes according to the range or the contents of the list you specified.

F6 (TABL)



Each cell can contain up to six digits, including negative sign.

You can use ◀, ▶, ▲, and ▼ to move the highlighting around the table for the following purposes.

- To display the selected cell's value at the bottom of the screen, using the calculator's current number of decimal place, number of significant digit, and exponential display range settings.
- To scroll the display and view parts of the table that do not fit in the display.
- To display at the top of the screen the scientific function that produced the value the selected cell (in columns Y1, Y2, etc.)
- To change *x* variable values by replacing values in column X.

Press F1 (FORM) to return to the TABLE Mode function list.

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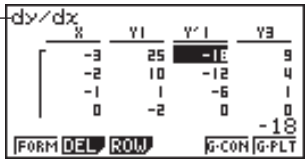
●To generate a differential numeric table

In the set up screen, change the setting of the Derivative item to On. Once you do this, the derivative is shown on the display whenever you generate a numeric table.

Locating the cursor at a differential coefficient displays the derived function.



- An error occurs if a graph for which a range is specified or an overwrite graph is included among the graph expressions.

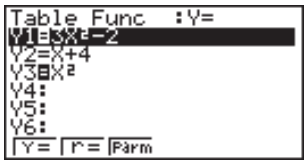
■ Specifying the function type

You can specify a function as being one of three types.

- Rectangular coordinate
- Polar coordinate
- Parametric

To display the menu of function types, press F3 (TYPE) while the function list is on the screen.

F3(TYPE)



F1 F2 F3

Press the function key (F1, F2, F3) that corresponds to the function type you want to specify.

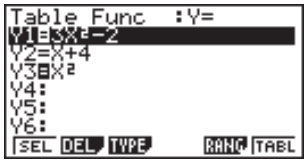
- When you generate a numeric table, a table is generated only for the function type you specify here.

15-3 Editing and Deleting Functions

●To edit a function

Example **To change the function in memory area Y1 from $y = 3x^2 - 2$ to $y = 3x^2 - 5$**

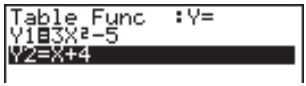
Use ▲ and ▼ to move the highlighting to the function you want to edit.



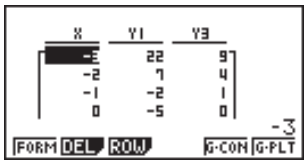
Use ◀ and ▶ to move the cursor to the location of the change.

▶▶▶▶▶ 5

EXE



F6 (TABL)



• The Function Link Feature automatically reflects any changes you make to functions in the **TABLE Mode** list in the **GRAPH Mode** and **DYNA Mode** lists.

●To delete a function

Use ▲ and ▼ to move the highlighting to the function you want to delete and then press F2 (DEL).

F2 (DEL)

Press F1 (YES) to delete the function or F6 (NO) to abort the operation without deleting anything.

15-4 Editing Tables and Drawing Graphs

You can use the table menu to perform any of the following operations once you generate a table.

- Change the values of variable *x*
- Edit (delete, insert, and append) rows
- Delete a table
- Draw a connect type graph
- Draw a plot type graph

While the Table & Graph menu is on the display, press [F6] (TABL) to display the table menu.

[F6] (TABL)

[F1] (FORM) .... Display function list
[F2] (DEL) ..... Delete table
[F3] (ROW)..... Display menu of row operations
[F5] (G•CON) .. Draw connected type graph
[F6] (G•PLT) .... Draw plot type graph

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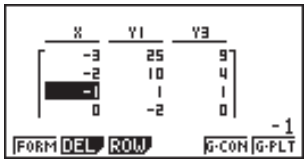
●To change variable values in a table

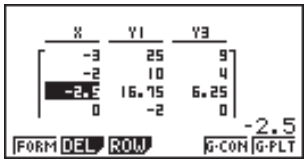
Example **To change the value in Column *x*, Row 3 of the table generated on page 239 from – 1 to – 2.5**

(▼)(▼)



(←) [2] [•] [5]

[EXE]



- When you change a variable value in Column *x*, all values in the columns to the right are recalculated and displayed.
- If you try to replace a value with an illegal operation (such as division by zero), an Ma ERROR occurs and the original value remains unchanged.
- You cannot directly change any values in the other (non-*x*) columns of the table.

■ Row Operations

The following menu appears whenever you press [F3] (ROW) while the table menu is on the display.

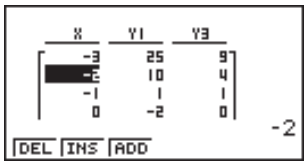
[F3](ROW)

[F1] (DEL) ..... Delete row
[F2] (INS) ..... Insert row
[F3] (ADD) ..... Add row

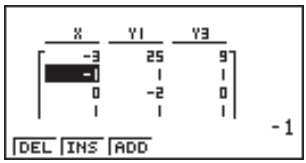
●To delete a row

Example **To delete Row 2 of the table generated on page 239**

[F3](ROW)▼



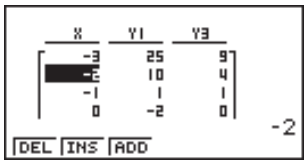
[F1](DEL)



●To insert a row

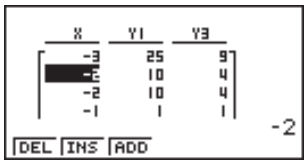
Example **To insert a new row between Rows 1 and 2 in the table generated on page 239**

F3(ROW)▼



F2

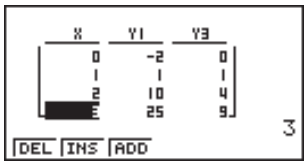
F2(INS)



●To add a row

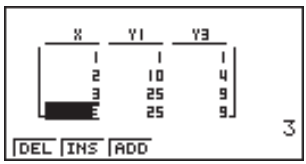
Example **To add a new row below Row 7 in the table generated on page 239**

F3(ROW)
▼▼▼▼▼▼



F3

F3(ADD)



■ Deleting a Table

1. Display the table you want to delete and then press F2 (DEL).

F2(DEL)

F1 F6

2. Press F1 (YES) to delete the table or F6 (NO) to abort the operation without deleting anything.

■ Graphing a Function

●To specify the draw/non-draw status of a formula

There are two options for the draw/non-draw status of a function graph.

- For the selected function only
- Overlay the graphs for all functions

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To specify the draw/non-draw status, use same procedure as that for specifying table generation/non-generation status.

●To graph only a selected function

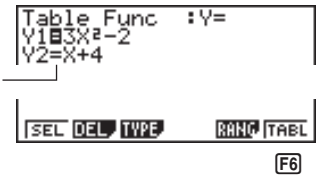
Example **To graph $y = 3x^2 - 2$, which is stored in memory area Y1, as a connect type graph.**

Use the following View Window parameters.

Xmin	**= 0**	**Ymin**	**= –2**
Xmax	**= 6**	**Ymax**	**= 106**
Xscale	**= 1**	**Yscale**	**= 2**

▼ F1 (SEL)

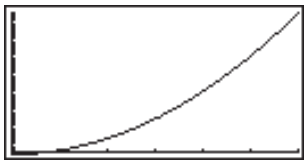
(Specifies graph non-draw.)



F6 (TABL)

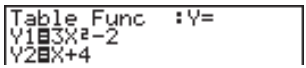
F5 (G•CON)

(Specifies connect type graph.)



●To graph all of the functions

Example **To use the values in the numeric table generated using the Table Range and the View Window parameters from the previous example to graph all functions stored in memory as plot type graphs.**



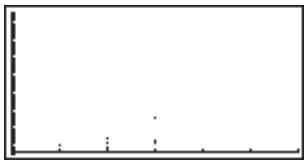
F6

F6(TABL)

F6

F6(G•PLT)

(Specifies plot type graph.)



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- After you graph a function, you can press SHIFT F6 (G↔T) or AC to return to the function's numeric table.
- After graphing a function, you can use the trace, zoom, sketch functions. For details, see "8-6 Other Graph Functions".

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●To graph a function using Dual Screen

Selecting "**T+G**" for the Dual Screen item of the set up screen makes it possible to display both the graph and its numeric table of values.

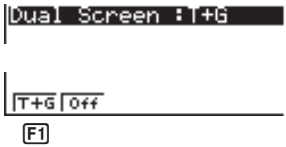
Example **To graph $y = 3x^2 - 2$ in memory are Y1, displaying both the graph and its table**

Use the same View Window parameters as in the example on page 245.

[SHIFT] [SETUP]

▼ ▼ [F1] (T+G)

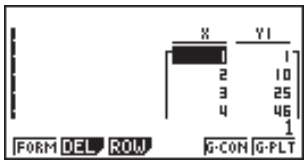
(Specifies T+G for Dual Screen.)



[EXIT]

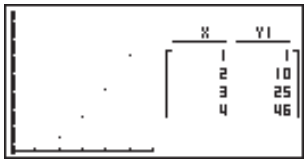
[F6] (TABL)

(Shows the table.)



[F6] (G•PLT)

(Draws plot type graph.)



- Pressing [SHIFT] [F6] (G↔T) causes the graph on the left side of the Dual Screen to fill the entire display. Note that you cannot use the sketch function while a graph is displayed using [SHIFT] [F6] (G↔T).

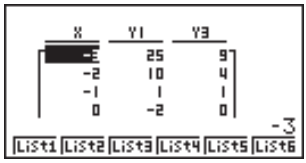
15-5 Copying a Table Column to a List

A simple operation lets you copy the contents of a numeric table column into a list.

●To copy a table to a list

Example **To copy the contents of Column *x* into List 1**

OPTN F1 (LIST) F2 (LMEM)



- You can select any row of the column you want to copy.

Press the function key (F1 to F6) that corresponds the list you want to copy to.

F1 (List1)