Chapter

17

17

List Function

A list is a kind of container that you can use to store multiple data items.
This calculator lets you store up to six lists in a single file, and up to six files in memory. Stored lists can be used in arithmetic, statistical, and matrix calculations, and for graphing.

	List 1	List 2	List 3	List 4	List 5	List 6
1	56	1	107	3.5	4	0
2	37	2	75	6	0	0
3	21	4	122	2.1	0	0
4	69	8	87	4.4	2	0
5	40	16	298	3	0	0
6	48	32	48	6.8	3	0
7	93	64	338	2	9	0
8	30	128	49	8.7	0	0

Element number   Display range   Cell   Column   List name   Row

List Data Linking

Operation

Graph

List operation

Example:
List 1 + List 2
{1, 2, 3} + {4, 5, 6}
List 1 + 3

List internal operations

List graphing

Y1=List 1X

From a graph to a list

Table data generated by
GRAPH TO TABLE to a list

LIST

Memory transfer

List→Mat(List 1,List
2,List 6_

Generating a table by
defining a list as the
variable.

Copying the column of a
specific table to a specific list.

OPTN
F1 (LIST)
F2 (LMEM)
F4 (List4)

Inside list

Memory transfer

Mat→List(Mat A,1

Example: To send column 1
of Mat A to a list

Matrix

Table

17-1   List Operations

Select the **LIST** icon in the Main Menu and enter the LIST Mode to input data into a list and to manipulate list data.

●To input values one-by-one

Use the cursor keys to move the highlighting to the list name or cell you want to select. Note that $\odot$ does not move the highlighting to a cell that does not contain a value.

	List 1	List 2	List 3	List 4
1	56	107	0	3.5
2	37	75	0	6
3	21	122	0	2.1
4	69	87	0	4.4
5	40	298	0	3
				56

SRT·A	SRT·D	DEL	DEL·A	INS

The screen automatically scrolls when the highlighting is located at either edge of the screen.

The following example procedure is performed starting with the highlighting located at Cell 1 of List 1.

1. Input a value and press [EXE] to store it in the list.

   [3] [EXE]

	List 1	List 2	List 3	List 4
1	3			
2				
3				
4				
5				

2. The highlighting automatically moves down to the next cell for input.

   • Note that you can also input the result of an expression in a cell. The following operation shows how to input the value 4 in the second cell and then input the result of 2 + 3 in the next cell.

   [4] [EXE] [2] [+] [3] [EXE]

	List 1	List 2	List 3	List 4
1	3			
2	4			
3	5			
4				
5				

●**To batch input a series of values**

1. Use the cursor keys to move the highlighting to another list.

List 1	**List 2**	List 3	List 4
1	3		

2. Press $\boxed{\text{SHIFT}}$ $\boxed{\{}$, and then input the values you want, pressing $\boxed{,}$ between each one. Press $\boxed{\text{SHIFT}}$ $\boxed{\}}$ after inputting the final value.

   $\boxed{\text{SHIFT}}$ $\boxed{\{}$ $\boxed{6}$ $\boxed{,}$ $\boxed{7}$ $\boxed{,}$ $\boxed{8}$ $\boxed{\text{SHIFT}}$ $\boxed{\}}$

List 1	**List 2**	List 3	List 4
1	3		
2	4		
3	5		
4			
5			

   {6,7,8}_
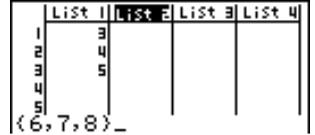
3. Press $\boxed{\text{EXE}}$ to store all of the values in your list.

   $\boxed{\text{EXE}}$

List 1	List 2	List 3	List 4
1	3	6	
2	4	7	
3	5	8	
4			
5			
			6

   SRT·A SRT·D DEL DEL·A INS

📝

• Remember that a comma separates values, so you should not input a comma after the final value of the set you are inputting.

Right: {34, 53, 78}

Wrong: {34, 53, 78,}

You can also use list names inside of a mathematical expression to input values into another cell. The following example shows how to add the values in each row in List 1 and List 2, and input the result into List 3.

1. Use the cursor keys to move the highlighting to the name of the list where you want the calculation results to be input.

List 1	List 2	**List 3**	List 4
1	3	6	
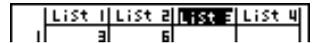
2. Press $\boxed{\text{OPTN}}$ and input the expression.

   $\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$(LIST)$\boxed{\text{F1}}$(List)$\boxed{1}$ $\boxed{+}$
   $\boxed{\text{F1}}$(List)$\boxed{2}$ $\boxed{\text{EXE}}$

List 1	List 2	List 3	List 4
1	3	6	9
2	4	7	11
3	5	8	13
4			
5			
			9

   List L→M Dim Fill Seq ▷
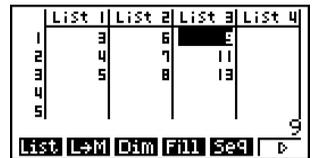
17-2 Editing and Rearranging Lists

■ Editing List Values

●To change a cell value

Use ⊙ or ⊙ to move the highlighting to the cell whose value you want to
change. Input the new value and press [EXE] to replace the old data with the new
one.

●To delete a cell

1. Use the cursor keys to move the highlighting to the cell you want to delete.

⊙ ⊙ ⊙

	List 1	List 2	List 3	List 4
1	3	6	9	
2	4	7	11	
3	5	8	13	
4				
5				4

SRT-A SRT-D DEL DEL-A INS

[F3]

2. Press [F3] (DEL) to delete the selected cell and cause everything below it to be
   shifted up.

	List 1	List 2	List 3	List 4
1	3	6	9	
2	5	7	11	
3		8	13	
4				
5				5

SRT-A SRT-D DEL DEL-A INS

• Note that the above cell delete operation does not affect cells in other lists. If
the data in the list whose cell you delete is somehow related to the data in
neighboring lists, deleting a cell can cause related values to become
misaligned.

●To delete all cells in a list

Use the following procedure to delete all the data in a list.

1. Use the cursor key to move the highlighting to any cell of the list whose data
   you want to delete.

2. Press [F4] (DEL-A). The function menu changes to confirm whether you really
   want to delete all the cells in the list.

3. Press [F1] (YES) to delete all the cells in the selected list or [F6] (NO) to abort
   the delete operation without deleting anything.

●**To insert a new cell**

1. Use the cursor keys to move the highlighting to the location where you want to insert the new cell.

	List 1	List 2	List 3	List 4
1	3	6		
2	5	7		
3		8		
4				
5				

2. Press [F5] (INS) to insert a new cell, which contains a value of 0, causing everything below it to be shifted down.

	List 1	List 2	List 3	List 4
1	3	6		
2	0	7		
3	5	8		
4				
5				

• Note that the above cell insert operation does not affect cells in other lists. If the data in the list where you insert a cell is somehow related to the data in neighboring lists, inserting a cell can cause related values to become misaligned.

■ Sorting List Values

You can sort lists into either ascending or descending order. The highlighting can be located in any cell of the list.

●**To sort a single list**

Ascending order

1. While the lists are on the screen, press [F1] (SRT-A).

	List 1	List 2	List 3	List 4
1	3	9		
2	5	5		
3	4	7		
4				
5				
H?	_			

How Many Lists?(H)

2. The prompt "How Many Lists? (H)" appears to ask how many lists you want to sort. Here we will input 1 to indicate we want to sort only one list.

[1] [EXE]

L? _
Select List(L)

3. In response to the "Select List (L)" prompt, input the number of the list you want to sort. Here we will input 2 to specify sorting of List 2.

    2 EXE

	List 1	List 2	List 3	List 4
1		3	5	
2		5	7	
3		4	9	
4				
5				

Descending order

Use the same procedure as that for the ascending order sort. The only difference is that you should press F2 (SRT-D) in place of F1 (SRT-A).

● To sort multiple lists

You can link multiple lists together for a sort so that all of their cells are rearranged in accordance with the sorting of a base list. The base list is sorted into either ascending order or descending order, while the cells of the linked lists are arranged so that the relative relationship of all the rows is maintained.

Ascending order

1. While the lists are on the screen, press F1 (SRT-A).

	List 1	List 2	List 3	List 4
1		3	9	
2		5	5	
3		4	7	
4				
5				
H?	—			

How Many Lists?(H)

2. The prompt "How Many Lists? (H)" appears to ask how many lists you want to sort. Here we will sort one base list linked to one other list, so we should input 2.

    2 EXE

B? —
Select Base List(B)

3. In response to the "Select Base List (B)" prompt, input the number of the list you want to sort into ascending order. Here we will specify List 1.

    1 EXE

L? —
Select Second List(L)

4. In response to the "Select Second List (L)" prompt, input the number of the list you want to link to the base list. Here we will specify List 2.

    2 EXE

	List 1	List 2	List 3	List 4
1	3	9		
2	4	7		
3	5	5		
4				
5				

Descending order

Use the same procedure as that for the ascending order sort. The only difference is that you should press F2 (SRT-D) in place of F1 (SRT-A).

• You can sort up to six lists at one time.

• If you specify a list more than once for a single sort operation, an error occurs.

An error also occurs if lists specified for sorting do not have the same number of values (rows).

17-3 Manipulating List Data

List data can be used in arithmetic and function calculations. In addition, various list data manipulation functions makes manipulation of list data quick and easy.

You can use list data manipulation functions in the **RUN**, **STAT**, **MAT**, **LIST**, **TABLE**, **EQUA** and **PRGM Modes**.

■ Accessing the List Data Manipulation Function Menu

All of the following examples are performed in the **RUN Mode**.

Press [OPTN] and then [F1] (LIST) to display the list data manipulation menu, which contains the following items.

- {**List**}/{**L→M**}/{**Dim**}/{**Fill**}/{**Seq**}/{**Min**}/{**Max**}/{**Mean**}/{**Med**}/{**Sum**}/{**Prod**}/ {**Cuml**}/{**%**}/{**⊿**}

Note that all closing parentheses at the end of the following operations can be omitted.

● **To count the number of values**   [OPTN]-[LIST]-[Dim]

    [OPTN] [F1] (LIST) [F3] (Dim) [F1] (List) <list number 1-6> [EXE]

- The number of cells that contain data in a list is called its "dimension."

Example	To enter the RUN Mode and count the number of values in List 1 (**36**, **16**, **58**, **46**, **56**)

    [AC] [OPTN] [F1] (LIST) [F3] (Dim)   ┌─────────────────────────┐
    [F1] (List) [1] [EXE]   │ Dim List 1   │
                                              │   5 │
                                              └─────────────────────────┘

● **To create a list or matrix by specifying the number of data**
                                                       [OPTN]-[LIST]-[Dim]

Use the following procedure to specify the number of data items in the assignment statement and create a list.

    <number of data *n*> [→] [OPTN] [F1] (LIST) [F3] (Dim) [F1] (List)
    <list number 1-6> [EXE]

    n = 1 ~ 255

Example   **To create five data items (each of which contains 0) in List 1**

$\boxed{\text{AC}}$ $\boxed{5}$ $\boxed{\rightarrow}$ $\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$(LIST) $\boxed{\text{F3}}$(Dim)
$\boxed{\text{F1}}$(List) $\boxed{1}$ $\boxed{\text{EXE}}$

List 1	List 2	List 3	List 4
0			
0			
0			
0			
0			

Use the following procedure to specify the number of data rows and columns, the matrix name in the assignment statement, and to create a matrix.

$\boxed{\text{SHIFT}}$ $\boxed{\{}$ <number of row *m*> $\boxed{,}$ <number of column *n*> $\boxed{\text{SHIFT}}$ $\boxed{\}}$ $\boxed{\rightarrow}$

$\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$(LIST) $\boxed{\text{F3}}$(Dim) $\boxed{\text{EXIT}}$ $\boxed{\text{F2}}$(MAT) $\boxed{\text{F1}}$(Mat) $\boxed{\text{ALPHA}}$ <matrix name> $\boxed{\text{EXE}}$

m, *n* = 1 ~ 255, matrix name; A ~ Z

Example   **To create a 2-row × 3-column matrix (with each cell containing 0) in Matrix A**

$\boxed{\text{AC}}$ $\boxed{\text{SHIFT}}$ $\boxed{\{}$ $\boxed{2}$ $\boxed{,}$ $\boxed{3}$ $\boxed{\text{SHIFT}}$ $\boxed{\}}$ $\boxed{\rightarrow}$
$\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$(LIST) $\boxed{\text{F3}}$(Dim) $\boxed{\text{EXIT}}$
$\boxed{\text{F2}}$(MAT) $\boxed{\text{F1}}$(Mat) $\boxed{\text{ALPHA}}$ $\boxed{A}$ $\boxed{\text{EXE}}$

A	1	2	3
1	**0**	0	0
2	0	0	0

● **To replace all cell values with the same value**   **[OPTN]-[LIST]-[Fill]**

$\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$ (LIST) $\boxed{\text{F4}}$ (Fill) <value> $\boxed{,}$ $\boxed{\text{F1}}$ (List) <list number 1-6> $\boxed{)}$ $\boxed{\text{EXE}}$

Example   **To replace all values in List 1 with the number 3**

$\boxed{\text{AC}}$ $\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$(LIST) $\boxed{\text{F4}}$(Fill)
$\boxed{3}$ $\boxed{,}$ $\boxed{\text{F1}}$(List) $\boxed{1}$ $\boxed{)}$ $\boxed{\text{EXE}}$

```
Fill(3,List 1)
                Done
```

The following shows the new contents of List 1.

List 1	List 2	List 3	List 4
3			
3			
3			
3			
3			

● **To generate a sequence of numbers**   **[OPTN]-[LIST]-[Seq]**

$\boxed{\text{OPTN}}$ $\boxed{\text{F1}}$ (LIST) $\boxed{\text{F5}}$ (Seq) <expression> $\boxed{,}$ <variable name> $\boxed{,}$ <start value> $\boxed{,}$ <end value> $\boxed{,}$ <pitch> $\boxed{)}$ $\boxed{\text{EXE}}$

• The result of this operation is stored in ListAns Memory.

| **Example** | To input the number sequence 1², 6², 11² into a list |

Use the following settings.

Variable: x Ending value: 11

Starting value: 1   Pitch: 5

[AC] [OPTN] [F1](LIST) [F5](Seq) [X,θ,T]
[x²] [,] [X,θ,T] [,] [1] [,] [1] [1] [,] [5] [)] [EXE]

```
Ans
 1[      ]
 2    36
 3   121
```

Specifying an ending value of 12, 13, 14, or 15 produces the same result as shown above since they are less than the value produced by the next increment (16).

●**To find the minimum value in a list**   **[OPTN]-[LIST]-[Min]**

[OPTN] [F1](LIST) [F6](▷) [F1](Min) [F6](▷) [F6](▷) [F1](List) <list number 1-6> [)] [EXE]

| **Example** | To find the minimum value in List 1 (36, 16, 58, 46, 56) |

[AC] [OPTN] [F1](LIST) [F6](▷) [F1](Min)
[F6](▷) [F6](▷) [F1](List) [1] [)] [EXE]

```
Min(List 1)
                16
```

●**To find the maximum value in a list**   **[OPTN]-[LIST]-[Max]**

Use the same procedure as when finding the minimum value (Min), except press [F2] (Max) in place of [F1] (Min).

●**To find which of two lists contains the smallest value**
                                    [OPTN]-[LIST]-[Min]

[OPTN] [F1](LIST) [F6](▷) [F1](Min) [F6](▷) [F6](▷) [F1] (List) <list number 1-6> [,] [F1] (List) <list number 1-6> [)] [EXE]

• The two lists must contain the same number of data items. Otherwise, an error occurs.

• The result of this operation is stored in ListAns Memory.

| **Example** | To find whether List 1 (75, 16, 98, 46, 56) or List 2 (35, 89, 58, 72, 67) contains the smallest value |

[OPTN] [F1](LIST) [F6](▷) [F1](Min)
[F6](▷) [F6](▷) [F1](List) [1] [,]
[F1](List) [2] [)] [EXE]

```
Ans
 1    35
 2    16
 3    58
 4    46
 5    56
```

●**To find which of two lists contains the greatest value**

[OPTN]-**[LIST]**-**[Max]**

Use the same procedure as that for the smallest value, except press [F2] (Max) in place of [F1] (Min).

• The two lists must contain the same number of data items. Otherwise, an error occurs.

●**To calculate the mean of list values**   **[OPTN]**-**[LIST]**-**[Mean]**

[OPTN] [F1](LIST) [F6] (▷) [F3](Mean) [F6] (▷) [F6] (▷) [F1](List) <list number 1-6> [)] [EXE]

Example   **To calculate the mean of values in List 1 (36**, **16**, **58**, **46**, **56)**

[AC] [OPTN] [F1](LIST) [F6] (▷) [F3](Mean)
[F6] (▷) [F6] (▷) [F1](List) [1] [)] [EXE]

```
Mean(List 1)
                    42.4
```

●**To calculate the mean of values of specified frequency**

[OPTN]-**[LIST]**-**[Mean]**

This procedure uses two lists: one that contains values and one that contains the number of occurrences of each value. The frequency of the data in Cell 1 of the first list is indicated by the value in Cell 1 of the second list, etc.

• The two lists must contain the same number of data items. Otherwise, an error occurs.

[OPTN] [F1](LIST) [F6] (▷) [F3](Mean) [F6] (▷) [F6] (▷) [F1](List)<list number 1-6 (data)> [,] [F1](List)<list number 1-6 (frequency)> [)] [EXE]

Example   **To calculate the mean of values in List 1 (36**, **16**, **58**, **46**, **56)**, **whose frequency is indicated by List 2 (75**, **89**, **98**, **72**, **67)**

[AC] [OPTN] [F1](LIST) [F6] (▷) [F3](Mean)
[F6] (▷) [F6] (▷) [F1](List) [1] [,]
[F1](List) [2] [)] [EXE]

```
Mean(List 1,List 2)
            42.07481297
```

●**To calculate the median of values in a list**   **[OPTN]**-**[LIST]**-**[Med]**

[OPTN] [F1](LIST) [F6] (▷) [F4](Med) [F6] (▷) [F6] (▷) [F1](List)<list number 1-6> [)] [EXE]

Example   **To calculate the median of values in List 1 (36**, **16**, **58**, **46**, **56)**

[AC] [OPTN] [F1](LIST) [F6] (▷) [F4](Med)
[F6] (▷) [F6] (▷) [F1](List) [1] [)] [EXE]

```
Median(List 1)
                     46
```

● **To calculate the median of values of specified frequency**

[OPTN]-[LIST]-[Med]

This procedure uses two lists: one that contains values and one that contains the number of occurrences of each value. The frequency of the data in Cell 1 of the first list is indicated by the value in Cell 1 of the second list, etc.

• The two lists must contain the same number of data items. Otherwise, an error occurs.

[OPTN] [F1] (LIST) [F6] (▷) [F4] (Med) [F6] (▷) [F6] (▷) [F1] (List) <list number 1-6 (data)> [,] [F1] (List) <list number 1-6 (frequency)> [)] [EXE]

Example	**To calculate the median of values in List 1 (36, 16, 58, 46, 56), whose frequency is indicated by List 2 (75, 89, 98, 72, 67)**

[AC] [OPTN] [F1] (LIST) [F6] (▷) [F4] (Med)
[F6] (▷) [F6] (▷) [F1] (List) [1] [,]
[F1] (List) [2] [)] [EXE]

```
Median(List 1,List 2)
                    46
```

● **To calculate the sum of values in a list**   [OPTN]-[LIST]-[Sum]

[OPTN] [F1] (LIST) [F6] (▷) [F6] (▷) [F1] (Sum) [F6] (▷) [F1] (List)<list number 1-6>
[EXE]

Example	**To calculate the sum of values in List 1 (36, 16, 58, 46, 56)**

[AC] [OPTN] [F1] (LIST) [F6] (▷) [F6] (▷)
[F1] (Sum) [F6] (▷) [F1] (List) [1] [EXE]

```
Sum List 1
                   212
```

● **To calculate the product of values in a list**   [OPTN]-[LIST]-[Prod]

[OPTN] [F1] (LIST) [F6] (▷) [F6] (▷) [F2] (Prod) [F6] (▷) [F1] (List)<list number 1-6> [EXE]

Example	**To calculate the product of values in List 1 (2, 3, 6, 5, 4)**

[AC] [OPTN] [F1] (LIST) [F6] (▷) [F6] (▷)
[F2] (Prod) [F6] (▷) [F1] (List) [1] [EXE]

```
Prod List 1
                   720
```

● **To calculate the cumulative frequency of each value**

[OPTN]-[LIST]-[Cuml]

[OPTN] [F1] (LIST) [F6] (▷) [F6] (▷) [F3] (Cuml) [F6] (▷) [F1] (List) <list number 1-6>
[EXE]

• The result of this operation is stored in ListAns Memory.

Example　　To calculate the cumulative frequency of each value in List 1
(**2**, **3**, **6**, **5**, **4**)

AC OPTN F1(LIST) F6(▷) F6(▷)
F3(Cuml) F6(▷) F1(List) 1 EXE

2+3=
2+3+6=
2+3+6+5=
2+3+6+5+4=

●**To calculate the percentage represented by each value**
[OPTN]-**[LIST]**-**[%]**

OPTN F1(LIST) F6(▷) F6(▷) F4(%) F6(▷) F1(List)<list number 1-6> EXE

• The above operation calculates what percentage of the list total is represented
by each value.

• The result of this operation is stored in ListAns Memory.

Example　　To calculate the percentage represented by each value in List 1
(**2**, **3**, **6**, **5**, **4**)

AC OPTN F1(LIST) F6(▷) F6(▷)
F4(%) F6(▷) F1(List) 1 EXE

2/(2+3+6+5+4) × 100 =
3/(2+3+6+5+4) × 100 =
6/(2+3+6+5+4) × 100 =
5/(2+3+6+5+4) × 100 =
4/(2+3+6+5+4) × 100 =

●**To calculate the differences between neighboring data inside a list**
[OPTN]-**[LIST]**-**[⊿]**

OPTN F1(LIST) F6(▷) F6(▷) F5(⊿) F6(▷)<list number 1-6> EXE

• The result of this operation is stored in ListAns memory.

Example　　To calculate the difference between the values in List 1
(**1**, **3**, **8**, **5**, **4**)

AC OPTN F1(LIST) F6(▷)
F6(▷) F5(⊿) 1 EXE

3 – 1 =
8 – 3 =
5 – 8 =
4 – 5 =

• You can specify the location of the new list (List 1 through List 6) with a statement like: ⊿ List 1 → List 2. You cannot specify another memory or ListAns as the destination of the ⊿ List operation. An error also occurs if you specify a ⊿ List as the destination of the results of another ⊿ List operation.

• The number of cells in the new list is one less than the number of cells in the original list.

• Note that an error occurs if you execute ⊿ List for a list that has no data or only one data item.

● **To transfer list contents to Matrix Answer Memory**

[OPTN]-[LIST]-[L→M]

[OPTN] [F1](LIST) [F2](L→M) [F1](List) <list number 1-6> [,] [F1](List) <list number 1-6> [ )] [EXE]

• You can input the following as many times as necessary to specify more than one list in the above operation.

[,] <list number 1-6>

Example   **To transfer the contents of List 1 (2, 3, 6, 5, 4) and List 2 (11, 12, 13, 14, 15) to Matrix Answer Memory**

[AC] [OPTN] [F1](LIST) [F2](L→M)
[F1](List) [1] [,] [F1](List) [2] [ )] [EXE]

Ans	1	2
1	2	11
2	3	12
3	6	13
4	5	14
5	4	15

17-4 Arithmetic Calculations Using Lists

You can perform arithmetic calculations using either two lists or one list and a numeric value.

ListAns Memory

List
Numeric Value $\left.\begin{array}{c}+\\-\\\times\\\div\end{array}\right\}$ List
Numeric Value $\boxed{=}$ $\left[\begin{array}{c}\text{List}\end{array}\right.$ Calculation results are stored in ListAns Memory.
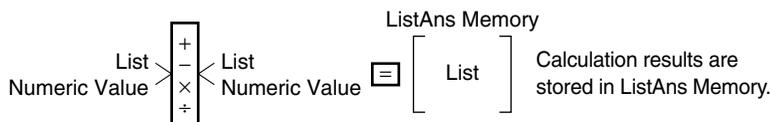
■ Error Messages

• A calculation involving two lists performs the operation between corresponding cells. Because of this, an error occurs if the two lists do not have the same number of values (which means they have different "dimensions").

• An error occurs whenever an operation involving any two cells generates a mathematical error.

■ Inputting a List into a Calculation

There are two methods you can use to input a list into a calculation.

●To input a specific list by name

Example   To input List 6

---

1. Press [OPTN] to display the first Operation Menu.
   • This is the function key menu that appears in the **RUN Mode** when you press [OPTN].

LIST **MAT** **CPLX** **CALC** **STAT** ▷
[F1]

2. Press [F1] (LIST) to display the List Data Manipulation Menu.

List **L→M** **Dim** **Fill** **Seq** ▷
[F1]

3. Press [F1] (List) to display the "List" command and input the number of the list you want to specify.

●To directly input a list of values

You can also directly input a list of values using [{], [}], and [,].

___
Example 1   To input the list: 56, 82, 64

[SHIFT] [{] [5] [6] [,] [8] [2] [,]   {56,82,64}_
[6] [4] [SHIFT] [}]

___
Example 2   To multiply List 3 $\left(= \begin{bmatrix} 41 \\ 65 \\ 22 \end{bmatrix} \right)$ by the list $\begin{bmatrix} 6 \\ 0 \\ 4 \end{bmatrix}$

[OPTN] [F1](LIST) [F1](List) [3] [X] [SHIFT] [{] [6] [,] [0] [,] [4] [SHIFT] [}] [EXE]

The resulting list $\begin{bmatrix} 246 \\ 0 \\ 88 \end{bmatrix}$ is stored in ListAns Memory.

● **To assign the contents of one list to another list**

Use [→] to assign the contents of one list to another list.

___
Example 1   To assign the contents of List 3 to List 1

[OPTN] [F1](LIST) [F1](List) [3] [→] [F1](List) [1] [EXE]

In place of [F1] (List) [3] in the above procedure, you could input
[SHIFT] [{] [4] [1] [,] [6] [5] [,] [2] [2] [SHIFT] [}].

___
Example 2   To assign the list in ListAns Memory to List 1

[OPTN] [F1](LIST) [F1](List) [SHIFT] [Ans] [→] [F1](List) [1] [EXE]

● **To input a single list cell value into a calculation**

You can extract the value in a specific cell of a list and use it in a calculation.
Specify the cell number by enclosing it between square brackets using the [[ ]
and [ ]] keys.

___
Example   To calculate the sine of the value stored in Cell 3 of List 2

[sin] [OPTN] [F1](LIST) [F1](List) [2] [SHIFT] [[ ] [3] [SHIFT] [ ]] [EXE]

● **To input a value into a specific cell**

You can input a value into a specific cell inside a list. When you do, the value that
was previously stored in the cell is replaced with the new value you input.

___
Example   To input the value 25 into Cell 2 of List 3

[2] [5] [→] [OPTN] [F1](LIST) [F1](List) [3] [SHIFT] [[ ] [2] [SHIFT] [ ]] [EXE]

■ Recalling List Contents

___Example___   **To recall the contents of List 1**

      OPTN F1 (LIST) F1 (List) 1 EXE

• The above operation displays the contents of the list you specify and stores them in ListAns Memory, which allows you to use the ListAns Memory contents in a calculation.

●To use list contents in ListAns Memory in a calculation

___Example___   **To multiply the list contents in ListAns Memory by 36**

      OPTN F1 (LIST) F1 (List) SHIFT Ans X 3 6 EXE

• The operation OPTN F1 (LIST) F1 (List) SHIFT Ans recalls ListAns Memory contents.
• This operation replaces current ListAns Memory contents with the result of the above calculation.

■ Graphing a Function Using a List

When using the graphing functions of this calculator, you can input a function such as Y1 = List1 X. If List 1 is {1, 2, 3}, this function will produces three graphs: Y = X, Y = 2X, Y = 3X.
There are certain limitations on using lists with graphing functions.

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■ Inputting Scientific Calculations into a List

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You can use the numeric table generation functions in the Table & Graph Menu to input values that result from certain scientific function calculations into a list. To do this, first generate a table. Next, use the "list copy" function to copy the values from the table to the list.

■ Performing Scientific Function Calculations Using a List

Lists can be used just as numeric values are in scientific function calculations. When the calculation produces a list as a result, the list is stored in ListAns Memory.

___Example 1___   **To use List 3** $\begin{bmatrix} 41 \\ 65 \\ 22 \end{bmatrix}$ **to perform sin (List 3)**

      Use radians as the angle unit.

      sin OPTN F1 (LIST) F1 (List) 3 EXE

The resulting list $\begin{bmatrix} -0.158 \\ 0.8268 \\ -8E-3 \end{bmatrix}$ is stored in ListAns Memory.

In place of the [F1] (List) [3] operation in the above procedure, you could input [SHIFT] [{] [4] [1] [,] [6] [5] [,] [2] [2] [SHIFT] [}].

Example 2 **To use List 1 $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ and List 2 $\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$ to perform List 1$^{List\,2}$**

List1 [∧] List2 [EXE]

This creates a list with the results of 1^4, 2^5, 3^6.

The resulting list $\begin{bmatrix} 1 \\ 32 \\ 729 \end{bmatrix}$ is stored in ListAns Memory.

17-5 Switching Between List Files

You can store up to six lists (List 1 to List 6) in each file (File 1 to File 6). A simple operation lets you switch between list files.

●To switch between list files

In the Main Menu, select the **LIST** icon and enter the LIST Mode.

Press SHIFT SETUP to display the LIST Mode set up screen.

```
List File    :File1
Angle        :Rad
Display      :Norm1



File1 File2 File3 File4 File5 File6
```

Press the function key to select the file you want.

Example   To select File 3

F3 (File3)   `List File    :File3`

EXIT

All subsequent list operations are applied to the lists contained in the file you select (List File3 in the above example).