

4 Lists

4.1 Defining lists

a. From the home screen

`2nd[{] 1,2,3,4,5 2nd[}] STO ▶ A`

```
(1,2,3,4,5)→A
      (1 2 3 4 5)
A
                                0
LA
      (1 2 3 4 5)
```

!! You can't use the letter **A** to work with list **A** !!

`2nd[LIST]<NAMES>` or `2nd[LIST]<OPS> B:L A`

```
NAME OPS MATH
1: L1
2: L2
3: L3
4: L4
5: L5
6: L6
7: A
```

```
NAMES OPS MATH
6: cumSum(
7: List(
8: Select(
9: augment(
0: List→matr(
A: Matr→list(
B: L
```

The **TI-83/84 Plus** has six standard lists in its memory: **L1** through **L6**. These lists are on the keys above the numerical keys **1** through **6**: `2nd[L1]`, ..., `2nd[L6]`.

b. In the **STAT** editor - **STAT 1:Edit**

The **STAT** editor is a kind of worksheet in which you can enter data like in a spreadsheet.

1	L2	L3	1	L1	L2	L3	1	L1	L2	L3	1
8	-----	-----		8	-----	-----		{8 -3 5 0 1 4 -...			
-3				-3				-2→L1(4)			
5				5							
0				0							
1				1							
4				4							
-1				-1							
L1 = {8, -3, 5, 0, 1, ...				L1(?) = -1				L1 = {8, -3, 5, -2, 1, ...			

DEL-key deletes a cell out of a list in the **STAT** editor

`2nd[INS]` inserts a cell (cell = 0) into a list in the **STAT** editor

CLEAR clears the content of a list (with the cursor on the list name)

STAT 5:SetUpEditor = **STAT** editor with the lists **L1** through **L6**

4.2 Calculations with lists

Define L_1 as $\{2, 3, 4\}$ and do the following calculations:

$$L_1+10, 3*L_1, 12/L_1 \text{ and } L_1 + L_1^2.$$

```
(2,3,4)→L1
L1+10      {2 3 4}
           {12 13 14}
3*L1       {6 9 12}
```

```
{12 13 14}
3*L1       {6 9 12}
12/L1      {6 4 3}
L1+L1^2    {6 12 20}
```

4.3 Logical operations with lists: 2nd[TEST]

<pre>LOGIC 1: 2: 3: 4: 5: 6:</pre>	<pre>(1,2,2,1,3,4)→L1 L1=1 {1 2 2 1 3 4} L1=2 {1 0 0 1 0 0} {0 1 1 0 0 0}</pre>	<pre>L1≠2 {1 0 0 1 1 1} L1≤2 {1 1 1 1 0 0} L1>2 {0 0 0 0 1 1}</pre>	<pre>(1,2,2,1,3,4)→L1 L1=2 {1 2 2 1 3 4} {0 1 1 0 0 0} sum(L1=2) 2</pre>
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With the command $2nd[LIST]<MATH> 5:sum($ in combination with a test you can examine how many elements meet a certain condition.

4.4 Operations with lists: 2nd[LIST]<OPS>

We will take a look at some of these commands.

- SortA(** sorts a list in an **A**scending order
- SortD(** sorts a list in a **D**escending order
- seq(** generates a **s**equences of numbers
- cumSum(** determines the cumulative sums of the elements of a list
- ΔList(** determines the difference of successive elements of a list

<pre>NAMES MATH 1:SortA(2:SortD(3:dim(4:Fill(5:seq(6:cumSum(7:ΔList(</pre>	<pre>(1,2,2,1,3,4)→L1 SortA(L1) Done L1 {1 1 2 2 3 4}</pre>	<pre>seq(X^2,X,1,100) L1 {1 4 9 16 25 36...} cumSum(L1) L1 {1 2 4 6 9 13}</pre>	<pre>L1 {2 6 1 5 9 3} ΔList(L1) {4 -5 4 4 -6} ΔList(Ans) {-9 9 0 -10}</pre>
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4.5 Lists and formulas

Define L1 as $\text{seq}(X^2, X, 1, 7)$.

L1	L2	L3	1
-----	-----	-----	
L1 = seq(X ² , X, 1, 7)			

L1	L2	L3	1
1 4 9 16 25 36 49	-----	-----	
L1 = {1, 4, 9, 16, 25...			

Define L2 as $L1^2$ and L3 as $\text{ALPHA}["] L1^2 \text{ALPHA}["]$.

L1	L2	L3	# 2
1 4 9 16 25 36 49	1 16 81 256 625 1296 2401	1 16 81 256 625 1296 2401	
L2 = {1, 16, 81, 256...			

L1	L2	L3	# 3
1 4 9 16 25 36 49	1 16 81 256 625 1296 2401	1 16 81 256 625 1296 2401	
L3 = "L1 ² "			

⊛ = the formula is blocked


Change the content of L1 into $\text{seq}(X, X, 1, 7)$. What happens with the content of L2 en L3?

L1	L2	L3	# 1
1 2 3 4 5 6 7	1 16 81 256 625 1296 2401	1 4 9 16 25 36 49	
L1(1) = 1			

4.6 Scatter plot

We will draw a scatter plot for the following data, the bounce of a ball, with **2nd[STAT PLOT] 1:Plot1**.

Put the cursor on **On** and press **ENTER**.


Select as **Type** the scatter plot icon () and define Xlist as **2nd[L1]** and Ylist as **2nd[L2]**.

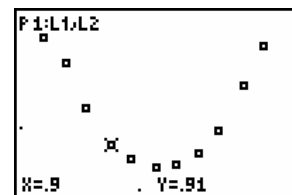
Plot the histogram with **ZOOM 9:ZoomStat**. With **TRACE** you can move the cursor from one data point to the next one.



L1	L2
t	x(t)
0.67	1.46
0.75	1.33
0.82	1.09
0.9	0.91
0.97	0.83
1.05	0.79
1.12	0.8
1.2	0.86
1.27	0.98
1.35	1.21
1.42	1.42

L1	L2	L3	1
.67 .75 .82 .9 .97 1.05 1.12	1.46 1.33 1.09 .91 .83 .79 .8	-----	
L1(4) = .9			

STAT PLOTS	
1:Plot1...Off	⊛
2:Plot2...Off	⊛
3:Plot3...Off	⊛
4:PlotsOff	⊛

ZOOM	
Plot2	Plot3
Off	Off
Type:	
Xlist:	L1
Ylist:	L2
Mark:	⊛



To connect the data points, select the xyLine icon () instead of the scatter plot icon ().