

3 Using the "Function Memory"

In this chapter we shall study the use of the "Function Memory" which is one of the features of the computer. This function greatly simplifies calculation of formula in which only the numeric values assigned to a variable differ.

3-1 Calculations with the Same Formula

This unit is provided with a very convenient function called “Function Memory”. This function permits easy calculations by simply assigning numeric values to the variable as long as the formula is stored in advance.

The following keys are used for the “Function Memory”.

IN Stores the contents currently written.

OUT Displays the stored content.

CALC If the stored content is a formula, the desired numeric value will be assigned to the used variables and the calculated result will be displayed.

A simple example is given below to learn the use of these three keys.

Example:

Obtain the value of y for each of the values assigned to x when $y = 3.43 \text{ Cos } x$.

(Calculate in three decimal places.)

x	8°	15°	22°	27°	31°
y					

Operation:

First specify the angle unit and number of decimal places.

MODE **4** (Angle unit: “DEG”)

SHIFT **SET** **F** **3** **EXE** (Obtain in three decimal places by rounding off the 4th decimal place.)

Next, input a formula, and press the **IN** key to store it.

Y **=** **3** **.** **4** **3** ***** **cos** **X** **IN**

Press the **OUT** key to confirm that the formula has been stored.

OUT

Y=3.43* COSX_

Then, start calculating by pressing the **CALC** key.

CALC
 8 EXE
 CALC
 15 EXE
 CALC
 22 EXE
 CALC
 27 EXE
 CALC
 31 EXE

X ?
Y= 3.397
X ?
Y= 3.313
X ?
Y= 3.180
X ?
Y= 3.056
X ?
Y= 2.940

As shown in this example, the “Function Memory” is ideal for calculating a formula in which only the numeric values assigned to a variable differ.

If we add a semicolon (;) at the end of the formula when storing, the formula can be executed repeatedly by pressing the **EXE** key instead of the **CALC** key.

Example:

Obtain the value of V for the respective values of r when $V = 4/3\pi r^3$. (Calculate in three decimal places by rounding off.)

r	4.579	7.381	9.244	6.133	1.416
V					

Operation:

First specify the number of decimal places.

SHIFT **SET** **F** 3 **EXE**

Then input the formula.

V **=** 4 **/** 3 ***** **SHIFT** **π** ***** **R** **x³** **:** **IN**

Start the calculations.

4.579

 7.381

 9.244

 6.133

 1.416

R ?
U= 402.162
R ?
U= 1684.357
R ?
U= 3308.784
R ?
U= 966.290
R ?
U= 11.893
Ready P0

Repeated operations can be terminated by pressing .

- Some of the points requiring care in using the “Function Memory” are listed below.
- 1) Character string of up to 62 characters can be stored with the **[IN]** key. The 63rd character and after will be discarded. Since spaces included in the commands and functions input with the one-key command will be counted as characters, delete these spaces with **[SHIFT][DEL]** if there are too many characters.
 - 2) The stored contents will be retained even if power is turned off or if Auto Power off function is activated.
 - 3) The stored data will be cleared if assembly is executed by pressing the **[A]** key after pressing the **[ASMBL]** key. (Refer to separate manual “Introduction to Assembly Language”).
 - 4) Error will occur when **[CALC]** is pressed if the stored content is other than a formula.
 - 5) The functions in the fomula must be numeric functions.
 - 6) The variables in the formula must be numeric variables A ~ Z (see page 57).
 - 7) If an exclusive character variable \$ (see page 57) is included in the formula, the content of the variable \$ will be used. (e.g. $VAL(\$)*A$, etc.)
- *It will be convenient to use the “Function Memory” in combination with the DATA BANK function. See Chapter 7, Section 7-10 “Combining with the Function Memory” on how to use this combination.

3-2 Utilization for Preparing Tables

Multiple formulas can be written by separating with colons (:). Tables such as that shown below can be easily prepared by using this method.

Example:

Complete the following table. (Calculate in three decimal places by rounding off.)

X	Y	$P = X \cdot Y$	$Q = X / Y$
4.27	1.17		
8.17	6.48		
6.07	9.47		
2.71	4.36		
1.98	3.62		

Operation:

SHIFT **SET** **F** **3** **EXE** (Specification of number of decimal places)

P **=** **X** ***** **Y** **:** **Q** **=** **X** **/** **Y** **:** **IN** (Storing the formula)

CALC (Calculation starts)

4.27 **EXE**

1.17 **EXE**

EXE

EXE

⋮

X ?
Y ?
P= 4.996
Q= 3.650
X ?

⋮

Continue to input the values of X and Y in this manner, and the values of P and Q will be calculated in successive order and the table will be completed as shown below.

X	Y	$P = X \cdot Y$	$Q = X / Y$
4.27	1.17	4.996	3.650
8.17	6.48	52.942	1.261
6.07	9.47	57.483	0.641
2.71	4.36	11.816	0.622
1.98	3.62	7.168	0.547

Messages can also be added by enclosing them in quotation marks (“ ”) immediately after the variables. This will be convenient since the message will be displayed at time of input and it will be possible to tell at a glance what value is being input.

Example:

Complete the following table. (Calculate in two decimal places by rounding off.)

Radius (r)	Height (h)	Volume of a cylinder ($U = \pi r^2 h$)	Volume of a cone ($V = 1/3U$)
1.205	2.227		
2.174	3.451		
3.357	7.463		

Operation:

SHIFT SET F 2 EXE

U SHIFT " CYLINDER SHIFT " = SHIFT π * R SHIFT " RADIUS SHIFT "

x^2 * H SHIFT " HEIGHT SHIFT " : V SHIFT " CONE SHIFT " = U / 3 : IN

CALC (Calculation starts.)

1.205 EXE

2.227 EXE

EXE

EXE

⋮

RADIUS ?
HEIGHT ?
CYLINDER= 10.16
CONE= 3.39
RADIUS ?

⋮

If the values of radius (r) and height (h) are input in this manner, volume (U) of the cylinder and volume (V) of the cone will be calculated successively and the table will be completed as shown below.

Radius (r)	Height (h)	Volume of a cylinder ($U = \pi r^2 h$)	Volume of a cone ($V = 1/3U$)
1.205	2.227	10.16	3.39
2.174	3.451	51.24	17.08
3.357	7.463	264.22	88.07

By using this "Function Memory", simple repetitive calculations can be performed easily without the need to use "Program Calculations" which will be explained in the next chapter.