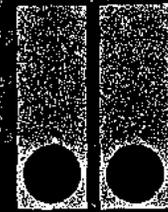


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MX-100
Electronic
Calculator



BOWMAR

Instructions
For Use

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INTRODUCTION

The Bowmar MX 100 Scientific Brain utilizes recent developments in solid-state integrated circuitry to provide a vast extension of conventional slide-rule capabilities, with far more accuracy. It is also more versatile, and it is compact enough to be pocketable. It replaces tedious and eye-straining correlation of finely inscribed slide-rule scales with a simpler touching of buttons on a keyboard. At the same time, it reduces determination of a numerical result to the reading of the numeral directly from a lucid display. It also supplements functions of a conventional log-log-decitrig slide-rule by featuring a memory that eases progress through complex multiple-operation problems.

Your new Brain operates in the algebraic mode and can accept a numerical input of as many as eight digits. It handles the four basic algebraic operations (addition, subtraction, multiplication, and division) and those scientific functions listed below, all with full floating point.

1. Sine, cosine, and tangent of degrees or radians (depending on the setting of an external switch).
2. Inverse trigonometric functions of sine, cosine, or tangent.
3. Natural and common logarithms
4. Exponential functions (e^x) and exponential powers (y^x)
5. Square root (\sqrt{x}) and inverse ($1/x$)
6. Keys for π and sign change

7. A key for the exchange of contents of the display register (x register) and working register (y register) 

In addition to these functions, your calculator has memory with the following means of access:

1. A storage key  for storing a displayed numeral in the memory.
2. A recall key  for withdrawing and displaying the content of the memory without losing it from the memory.
3. An exchange key  for exchanging contents of the display and memory registers.
4. A memory clear key  for discarding content of the memory.

Your calculator also features capability for chain and automatic constant operations. Its display is right adjusted with leading zero suppression. With algebraic operations, results of up to sixteen digits may be obtained by use of overflow interpretation. With scientific operations, display results may contain up to six digits, the last digit having a ± 1 tolerance.

To realize the full potential of the MX100 you are asked to carefully read the following material and instructions. Optimum familiarity can be gained only through frequent use, and as a start you are advised to follow through each illustrative instruction with your calculator in hand. During routine use, reminders of operational procedures may be obtained from the brief outline of instructions printed on the back of the calculator.

OPERATION

AC Operation:

Set the switch on the back of the Charger/Power Supply to the electrical outlet voltage, i.e., 115 or 230 Volts. Plug the Charger into the outlet and the connector into the Calculator. (Note that the connector is keyed.) After these connections, the power switch may be turned on and operation started.

Battery Operation:

Disconnect the Charger cord and turn the power switch "ON". With normal use a full battery charge can be expected to supply about 4 hours of working time.

NOTE: When the low battery indicator (L) on the display is lighted, do not continue battery operation. This indicates need for a battery charge.

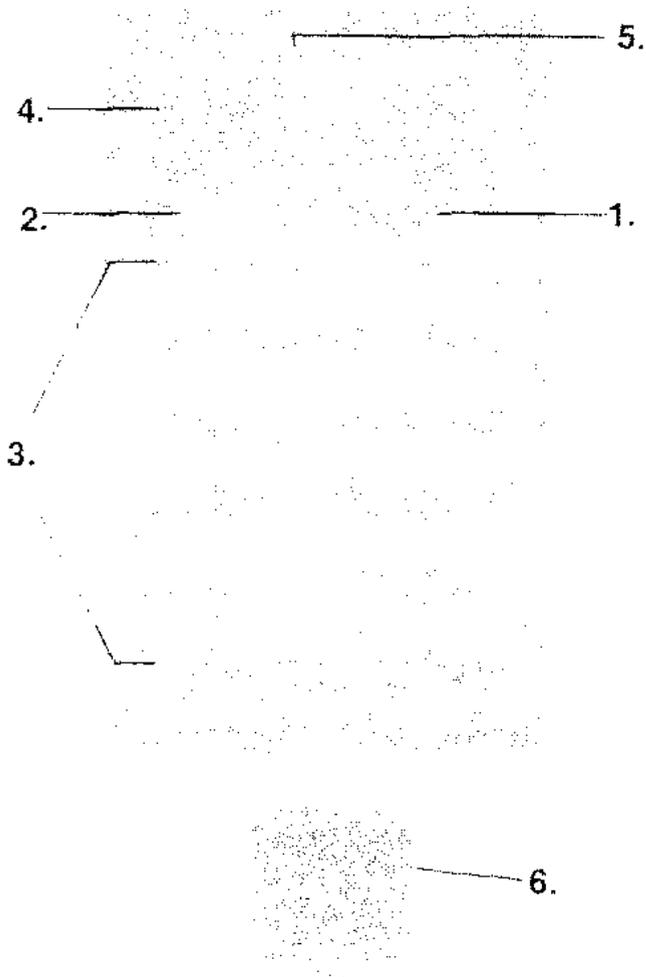
Use of the Calculator can be continued during the charge cycle. Charging will continue whether calculator is on or off.

Battery Charging:

Simply follow the same procedure as in AC operation. The Calculator may be used during the charge period if desired. In order to fully charge a battery which has been completely discharged, 7 hours is required. In most cases, an overnight charge should be adequate.

NOTE: Although no damage will result from prolonged periods with the Charger connected, it is advisable to remove the Charger when it is not in use or after a full recharge cycle.

CAUTION: To avoid possible damage, use only the charger provided with the calculator.



CONTROLS & INDICATORS

NOTE: Descriptions that follow will be better understood if you take a moment to learn these basic facts.

First, two separate registers are provided for retaining the numbers you enter into the Calculator for an arithmetic operation. One is the Display Register which is also referred to as the x Register. The other is Working Register or y Register. Any number you enter is keyed directly into the Display (x Register) for your visual review. This entry is then completed when you key in the appropriate arithmetic operative (+, -, x, or \div). As you begin to enter the second number, the first is automatically transferred from the x Register to the y Register. The y Register retains this first number until you clear it or you exchange contents of the x and y Registers by means of a special key provided for that purpose.

Second, your Calculator Keyboard was designed for a minimum of keys in order to provide optimum fingertip access within convenient confines. This feature was enabled by incorporating a block of dual purpose keys that work in conjunction with an electronic "shift" system.

The electronic "shift" of your calculator compares with the shift of a typewriter. Your calculator responds to the characters on the keys in its unshifted mode, and it must be shifted each time a key is to be operated for a function printed above a key. The calculator's shift key is identified by the letter "F". Refer to the section of PRELIMINARY INSTRUCTION for details of dual purpose keys.

1. "ON" Switch A two position slide switch that turns the Calculator "ON" & "OFF".
2. DEG/RAD Switch A two position slide switch that selects degrees or radians for the expression of angles.

3. Keyboard
25 keys that may be categorized into groups of data keys, arithmetic operation keys, memory operation keys, and command function keys as follows:

A. **Data Function Keys** (all are dual-purpose and labelled accordingly. Character mode refers to label on keyface, while Function mode refers to label situated directly above key.)

| Key | Character Mode | Function Mode |
|-------------------|-------------------------------------|---|
| \sqrt{x} [] | enters ' $\sqrt{\quad}$ ' (decimal) | Computes square root of a displayed number that is greater than zero. Error condition is set for a negative number. |
| $1/x$ [] | enters '0' | Computes reciprocal of a displayed number. Error condition is set for a display of zero. |

e^x
[] enters '1' Raises e(2.71828) to power of x shown on the Display, up to a limit of $x = 18.42$.

LNX
[] enters '2' Computes the natural logarithm of any displayed number greater than zero. Error condition is set for a negative number.

LOG X
[] enters '3' Computes the logarithm (base 10) of any displayed number greater than zero. Error condition is set for a negative number.

SIN^{-1}
[] enters '4' Computes the arcsine, in degree or radians, of any displayed number from 0 to ± 1 . Error condition is set for any other number.

COS^{-1}
[] enters '5' Computes the arcosine, in degrees or radians, of any displayed number from 0 to ± 1 . Error condition is set for any other number.

TAN^{-1}
[] enters '6' Computes the arc-tangent, in degrees or radians, of any displayed number whether positive or negative.

SIN
7

enters '7' Computes the sine, with proper sign, of any displayed angle, whether in degrees or radians and whether positive or negative.

COS
8

enters '8' Computes the cosine, with proper sign, of any displayed angle, whether in degrees or radians and whether positive or negative.

TAN
9

enters '9' Computes the tangent, with proper sign, of any displayed angle, whether in degrees or radians and whether positive or negative.

B. Arithmetic Operation Keys

+

Completes the previous operation and sets add command.

-

Completes the previous operation and sets subtract command.

X

Completes previous operation and sets 'multiply' operation.

8

÷

Completes previous operation and sets divide command.

=

Completes previously entered add, subtract, multiply, divide or y^x instruction.

C. Memory Operation Keys

MC

Clears the Memory to zero.

M+

Adds the Displayed number to the content of the memory and stores the sum in the memory.

MR

Displays the content of the memory. The content of the memory is not lost with this operation.

↔

Exchanges contents of the x (Display) Register and the Memory.

D. Command Function Keys

CE
C

During an entry it clears the entry with single depression. For all other operations, it clears all registers except the memory register with single depression.

9



It clears the overflow sign with single depression.

Enables a number y to be raised to a power x (see pertinent instructions).



Shifts between Function and Character Modes of dual-purpose keys.



A dual-purpose key that changes sign of the Displayed number in the Character Mode, and displays π (3.1415926) in the Function Mode.



Exchanges contents of x and y Registers.

- 4. Low Battery Indicator Warns of need for battery charge during battery operation.

Appears as: **L**

Minus Sign Indicator Appears as: **-**

Error and Overflow Indicator

Indicates a condition or computation that the Calculator is not intended for or cannot perform. Also indicates Overflow.

Appears as: **Γ**

Decimal Point Indicator

Automatically appears to the right of any number entered, unless inserted in another sequence by use of the Decimal key.

Function Mode Indicator

Confirms shift of dual function keys from Character to Function Mode.

Appears as: ****

5.

Charger Cord Socket

6.

Charger/Power Supply

PRELIMINARY INSTRUCTIONS

1. To clear for new operation

A. Touch the **CE/C** key two consecutive times to clear all registers

B. Cleared display will be: **0.**

2. To clear an incorrect entry

Example: 48 + 12 is your calculation

A. You have already entered 48 +
Display is: **48.**

- B. Then you enter 13 instead of 12.
Display is:

13.

A mistake!

- C. To clear 13, touch the **CE** key once only.
Display is:

0.

- D. Then enter 12.
Display is:

12.

- E. Finally, touch the **=** key for answer.
Display is:

60.

NOTE: An incorrect entry should be cleared prior to any other entry or operation.

3. To enter a number

Example: enter 123.45

- A. Starting with the left-most digit touch keys as follows: 1, 2, 3, ., 4, and 5.
B. Display will be:

123.45

4. To enter a mathematical computation

Entry of a computation is greatly simplified when it is first converted to algebraic form.

$$1. \begin{array}{r} 438 \\ + 296 \\ \hline \end{array} \quad 2. \begin{array}{r} 438 \\ - 296 \\ \hline \end{array} \quad 3. \begin{array}{r} 438 \\ \times 296 \\ \hline \end{array} \quad 4. \begin{array}{r} 296 \overline{) 438} \\ \hline \end{array}$$

In algebraic form, these computations are:

$$1. 438 + 296 = \quad 2. 438 - 296 = \\ 3. 438 \times 296 = \quad 4. 438 \div 296 =$$

These computations are then entered a digit or operative at a time, beginning with the left-most figure and progressing to the right. For full details refer to specific instructions and examples that follow.

5. Reading a numerical result

- A. Results of eight digits or less are read directly from the Display.
B. In certain computations, zeroes at the extreme right of a decimal result will be suppressed. For example, a result representing \$16.30 may appear as:

16.3

- C. Results of more than eight but less than seventeen digits will appear with the overflow Indicator (described under Controls & Indicators). See Instructions for Overflow Interpretation.

SUBTRACTION

Example #3: To calculate $12.81 - 3.6 =$

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 12.81 **12.81**
- c. Touch **-** **12.81**
- d. Enter 3.6 **3.6**
- e. Touch **=** Answer **9.21**

Example #4:

To calculate $23 - 6 + 2.1 - 5 =$

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 23 **23.**
- c. Touch **-** **23.**
- d. Enter 6 **6.**
- e. Touch **+** **17.**
- f. Enter 2.1 **2.1**
- g. Touch **-** **19.1**
- h. Enter 5 **5.**
- i. Touch **=** Answer **14.1**

Example #5:

To calculate $62 - 82 + 10 - 40 =$

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 62 **62.**
- c. Touch **-** **62.**
- d. Enter 82 **82.**
- e. Touch **+** **- 20.**
- f. Enter 10 **10.**
- g. Touch **-** **- 10.**
- h. Enter 40 **40.**
- i. Touch **=** Answer **- 50.**

MULTIPLICATION

Example #6 To calculate $29.32 \times 56.5 =$

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 29.32 **29.32**
- c. Touch **X** **29.32**
- d. Enter 56.5 **56.5**

e. Touch **=** Answer **1656.58**

DIVISION

Example #7: To calculate $81 \div 3 \div 9 =$
Do these steps display will be

- a. Touch **CE** twice **0.**
- b. Enter 81 **81.**
- c. Touch **÷** **81.**
- d. Enter 3 **3.**
- e. Touch **÷** **27.**
- f. Enter 9 **9.**
- g. Touch **=** Answer **3.**

REPEATED OPERATIONS

Example #8:
Arithmetic operations (add, subtract, multiply, and divide) may be repeated on a single number as follows (using the number 3 as an example).
Initial steps for each operation are

- a. Touch **CE** twice to get **0.**
- b. Enter 3 to get **3.**

then do these steps

| | | | | |
|--|------------|-----------------|-----------------|---------------|
| | for add | for subtract | for multiply | for divide |
|--|------------|-----------------|-----------------|---------------|

| | | | | | |
|----------|--|-----|-----|-----|-----------|
| c. Enter | + or - or X or ÷ | 3. | 3. | 3. | 3. |
| | | ↓ | ↓ | ↓ | ↓ |
| d. Touch | → | 6. | 0. | 9. | 1. |
| e. Touch | = | 9. | -3. | 27. | 0.3333333 |
| f. Touch | = | 12. | -6. | 81. | 0.1111111 |
| g. etc. | | | | | |

CHAIN OPERATIONS (Mixed Arithmetic)

Example #9:

To calculate $(73 + 26) 15 - 49 \div 38 =$

| Do these steps | display will be |
|----------------------------|-----------------|
| a. Touch CE/C twice | 0. |
| b. Enter 73 | 73. |
| c. Touch + | 73. |
| d. Enter 26 | 26. |
| e. Touch X | 99. |
| f. Enter 15 | 15. |
| g. Touch - | 1485. |
| h. Enter 49 | 49. |
| i. Touch ÷ | 1436. |
| j. Enter 38 | 38. |
| k. Touch = Answer | 37.789473 |

CONSTANT OPERATIONS

Addition, subtraction, multiplication, and division by a constant may be performed as follows (using the number 'N' as the constant).

A. Addition

Example #10:

| Do these steps | display will be |
|----------------------------|-----------------|
| a. Touch CE/C twice | 0. |
| b. Touch + | 0. |
| c. Enter N | N. |
| d. Touch = | N. |
| e. Enter the number X | X. |
| f. Touch = | N + X. |
| g. Enter the number Y | Y. |
| h. Touch = | N + Y. |
| i. Enter the number Z | Z. |
| j. Touch = | N + Z. |
| k. etc. | |

B. Subtraction

Example #11:

| | |
|----------------------------|-----|
| a. Touch CE/C twice | 0. |
| b. Enter 2N | 2N. |

- c. Touch **=** **2N.**
- d. Enter **N** **N.**
- e. Touch **=** **N.**
- f. Enter the number **X** **X.**
- g. Touch **=** **X - N.**
- h. Enter the number **Y** **Y.**
- i. Touch **=** **Y - N.**
- j. etc.

C. Multiplication
Example #12:

- a. Touch **CE/C** twice **0.**
- b. Enter **N** **N.**
- c. Touch **X** **N.**
- d. Enter the number **Y** **Y.**
- e. Touch **=** **N x Y.**
- f. Enter the number **Z** **Z.**
- g. Touch **=** **N x Z.**
- h. etc.

D. Division

Example #13:

- a. Touch **CE/C** twice **0.**
- b. Enter **N²** **N².**
- c. Touch **÷** **N².**
- d. Enter **N** **N.**
- e. Touch **=** **N.**
- f. Enter the number **X** **X.**
- g. Touch **=** **X/N.**
- h. Enter the number **Y** **Y.**
- i. Touch **=** **Y/N.**
- j. etc.

FUNCTION OPERATIONS

(using **F** key)

I Trigonometric Function

All trigonometric functions may be performed in degrees or radians, as determined by positioning of the DEG/RAD switch.

A. Sine

Example #14: To obtain SIN 32°

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 32 degrees **32.**

- c. Touch **F** **SIN** $\sqrt{\quad}$ 32.
 d. Touch **7** Answer $\sqrt{\quad}$ 0.529919

Example #15:

To obtain SIN 4.4157 radians

(set the DEG/RAD switch to RAD)

Do these steps display will be

- a. Touch **CE** **C** twice $\sqrt{\quad}$ 0.
 b. Enter 4.4157 $\sqrt{\quad}$ 4.4157
 c. Touch **F** **SIN** $\sqrt{\quad}$ 4.4157
 d. Touch **7** Answer $\sqrt{\quad}$ 0.95631

Example #16: To obtain SIN (-198°)

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE** **C** twice $\sqrt{\quad}$ 0.
 b. Enter 198 degrees $\sqrt{\quad}$ 198.
 c. Touch **CS** $\sqrt{\quad}$ - 198.
 d. Touch **F** **SIN** $\sqrt{\quad}$ 198.
 e. Touch **7** Answer $\sqrt{\quad}$ 0.309017

B. Cosine

Example #17: To obtain COS 32°

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE** **C** twice $\sqrt{\quad}$ 0.
 b. Enter 32 degrees $\sqrt{\quad}$ 32.
 c. Touch **F** **COS** $\sqrt{\quad}$ 32.
 d. Touch **8** Answer $\sqrt{\quad}$ 0.848048

C. Tangent

Example #18: To obtain TAN 32°

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE** **C** twice $\sqrt{\quad}$ 0.
 b. Enter 32 degrees $\sqrt{\quad}$ 32.
 c. Touch **F** **TAN** $\sqrt{\quad}$ 32.
 d. Touch **9** Answer $\sqrt{\quad}$ 0.624869

II Inverse Trigonometric Functions

(degrees or radians)

A. Arcsine

Example #19: To obtain SIN⁻¹ 0.529919

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE** **C** twice $\sqrt{\quad}$ 0.
 b. Enter .529919 $\sqrt{\quad}$ 0.529919

- c. Touch **F**
SIN⁻¹ **0.529919**
- d. Touch **4** Degrees **31.99998**

Example #20: To obtain SIN⁻¹ (-0.529919)

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter .529919 **0.529919**
- c. Touch **CS**
 π **- 0.529919**
- d. Touch **F**
SIN⁻¹ **< 0.529919**
- e. Touch **4** Degrees **- 31.99998**

B. Arcosine

Example #21: To obtain COS⁻¹ 0.848048 in Radians

(set the DEG/RAD switch to RAD)

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter .848048 **0.848048**
- c. Touch **F**
COS⁻¹ **\ 0.848048**
- d. Touch **5** Radians **0.558505**

C. Arctangent

Example #22: To obtain TAN⁻¹ 0.624869

(set the DEG/RAD switch to DEG)

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter .624869 **0.624869**
- c. Touch **F**
TAN⁻¹ **\ 0.624869**
- d. Touch **6** Degrees **31.99999**

III Exponential Function

Example #23: To obtain e^{-2.32}

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 2.32 **2.32**
- c. Touch **CS**
 π **- 2.32**
- d. Touch **F**
 e^x **< 2.32**
- e. Touch **1** Answer **0.098274**

IV Natural Logarithm

Example #24: To obtain $\ln 5.623$

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 5.623 **5.623**
- c. Touch **F**
LNx **\ 5.623**
- d. Touch **2** Answer **1.726866**

V Common Logarithm

Example #25: To obtain $\log_{10} 4.83$

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 4.83 **4.83**
- c. Touch **F**
LOGx **\ 4.83**
- d. Touch **3** Answer **0.683947**

VI Square Root

Example #26: To obtain $\sqrt{341.57}$

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 341.57 **341.57**
- c. Touch **F**
 \sqrt{x} **\ 341.57**
- d. Touch **.** Answer **18.481612**

VII Reciprocal

Example #27:

To obtain the reciprocal of 638.72

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 638.72 **638.72**
- c. Touch **F**
 $1/x$ **\ 638.72**
- d. Touch **0** Answer **0.0015656**

VIII Pi (π)

Example #28: To obtain a numerical readout for the constant π .

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Touch **F**
 π **\ 0.**
- c. Touch **CS** Answer **3.1415926**

EXPONENTIAL POWER

Example #29: To obtain $(35)^{3.2}$

Do these steps display will be

- a. Touch **CE**
C twice **0.**
- b. Enter 35 **35.**
- c. Touch **y^x** gives the natural log of 35 **3.555349**
- d. Enter 3.2 **3.2**
- e. Touch **=** Answer **87300.83**

MEMORY OPERATIONS

The following exercise is aimed at familiarizing you with memory operations and capability.

| Do these steps | display will be | memory will contain |
|----------------------------|-----------------|---------------------|
| a. Touch CE/C twice | 0. | ? |
| b. Touch MC | 0. | 0. |
| c. Enter 250 | 250. | 0. |
| d. Touch M+ | 250. | 250. |
| e. Enter 300 | 300. | 250. |
| f. Touch M+ | 300. | 550. |
| g. Touch X | 300. | 550. |
| h. Enter 120 | 120. | 550. |
| i. Touch M+ | 120. | 670. |
| j. Touch = | 36000. | 670. |
| k. Enter 50 | 50. | 670. |
| l. Touch + | 50. | 670. |
| m. Touch MR | 670. | 670. |
| n. Touch = | 720. | 670. |
| o. Touch MI | 670. | 720. |
| p. Touch CE/C | 0. | 720. |
| q. Touch MC Answer | 0. | 0. |

TRANSFER X AND Y REGISTER CONTENTS

The **XY** key offers many possibilities for use. One of these offered below.

Example #30: The problem $36 + 72$ has been entered, and you decide to change the number 36 to 35. Proceed as follows, first by entering the problem:

| Do these steps | display will be | Y register |
|----------------------------|-----------------|------------|
| a. Touch CE/C twice | 0. | — |
| b. Enter 36 | 36. | — |
| c. Touch + | 36. | — |
| d. Enter 72 | 72. | 36. |
| To change 36 to 35 | | |
| e. Touch XY | 36. | 72. |
| f. Touch CE/C once | 0. | 72. |
| g. Enter 35 | 35. | 72. |
| h. Touch = Answer | 107. | 72. |

MIXED PROBLEMS

Example #31: do $36 + \frac{9}{8 + \frac{3}{46}} =$

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 3 **3.**
- c. Touch **÷** **3.**
- d. Enter 46 **46.**
- e. Touch **+** **0.0652173**
- f. Enter 8 **8.**
- g. Touch **=** **8.0652173**
- h. Touch **F** **\ 8.0652173**
- i. Touch **1/x** **0.1239892**
- j. Touch **X** **0.1239892**
- k. Enter 9 **9.**
- l. Touch **+** **1.1159028**
- m. Enter 36 **36.**
- n. Touch **=** Answer **37.115902**

Example #32: find the antilog of .30103 (base 10)

A. One way is to raise 10 to the power of the logarithm as follows:

Do these steps display will be

- a. Touch **CE/C** twice **0.**
- b. Enter 10 **10.**
- c. Touch **y^x**
(gives natural log of 10.) **2.302585**
- d. Enter .30103 **0.30103**
- e. Touch **=** Answer **1.999999**

Example #33: do

$$\frac{\sqrt{36(36-43)(36-15)(36-94)}}{36} =$$

Do these steps display will be memory will hold

- a. Touch **CE/C** twice **0.** —
- b. Touch **MC** **0.** 0.
- c. Enter 36 **36.** 0.
- d. Touch **-** **36.** 0.
- e. Enter 94 **94.** 0.
- f. Touch **=** **58.** 0.
- g. Touch **M+** **58.** -58.

| | | | |
|--|-------------------------------|------------------|------------------|
| p. Touch | F | 0.5298848 | |
| q. Touch | \sqrt{x} • Answer | 0.7279318 | |
| Example #35: $8\text{SIN}^3(7^\circ)\text{COS}^3(7^\circ)$ | | | |
| Do these steps | | display will be | memory will hold |
| a. Set DEG/RAD switch to DEGREES | | | |
| b. Touch | CE C twice | 0. | 0. |
| c. Touch | MC | 0. | 0. |
| d. Enter 7 | | 7. | 0. |
| e. Touch | F SIN | 7. | 0. |
| f. Touch | 7 | 0.121869 | 0. |
| g. Touch | X | 0.121869 | 0. |
| h. Touch | = | 0.014852 | 0. |
| i. Touch | = | 0.0018099 | 0. |
| j. Touch | X | 0.0018099 | 0. |
| k. Enter 8 | | 8. | 0. |
| l. Touch | = | 0.0144792 | 0. |
| m. Touch | M+ | 0.0144792 | 0.0144792 |
| n. Enter 7 | | 7. | 0.0144792 |

| | | | |
|----------|------------------------|------------------|-----------|
| o. Touch | F COS | 7. | 0.0144792 |
| p. Touch | 8 | 0.992546 | 0.0144792 |
| q. Touch | X | 0.992546 | 0.0144792 |
| r. Touch | = | 0.9851475 | 0.0144792 |
| s. Touch | = | 0.9778042 | 0.0144792 |
| t. Touch | X | 0.9778042 | 0.0144792 |
| u. Touch | MR | 0.0144792 | 0.0144792 |
| v. Touch | = Answer | 0.0141578 | 0.0144792 |

OVERFLOW INTERPRETATION

The positive or negative overflow indicator, indicated by Γ or \sqsubset , respectively, will appear when the display capacity of the calculator is exceeded.

For example, multiplication of two positive numbers,

$$12345678 \times 345678$$

will give the following display

Γ 42676.292

The ' Γ ' symbol indicates positive 'overflow' and indicates an answer of more than 8 digits shown. To obtain the correct decimal location for either case, simply record the displayed number and move the decimal point 8 places to the right.

The real answer will then be:

4,267,629,200,000.

\sqsubset 8 places \uparrow

This procedure applies to all operations. Use the

CE
C key to clear the overflow.

SPECIFICATIONS

Capabilities:

Algebraic Functions — addition, subtraction, multiplication, division, reciprocals, square roots, sign change and π , (3.1415926).

Scientific Functions — exponential functions (e^x), natural and common logarithms, arcsine, arcosine, arctangent, exponential powers (y^x), sine, cosine, tangent.

Memory Functions — memory storage, memory recall, memory clear, exchange of memory content and display.

Miscellaneous — exchange of x and y register contents, chain and constant operations, right adjusted display with leading zero suppression, overflow, low battery and scientific mode indicator.

Decimal Point:

Full floating decimal point.

Accuracy:

Algebraic Functions — 8 digits.

Scientific Functions — the 6 left-most digits shall be correct to within ± 1 in the sixth digit from the left, including any suppressed zeroes.

Power:

AC Operation — 110/120V, 50/60 Hertz

Battery Operation — NiCad Cells (3);

4 hour operation; 7 hour charge.

Electronic Configuration:

Solid State — primarily integrated circuitry plus certain discrete components.

Dimensions: 1¼ in. H, 3 in. W, 5 in. D.

Weight: 9 oz.

Accessories: Charger/Power Supply; Vinyl Pouch; Instruction Book.

Calculation Speed: 3 Seconds Maximum

Operating Temp.: 0°C to 50°C

Storage Temp.: -20°C to +70°C

Calculation Range: Up to $10^{16} - 1$

BATTERY NOTES

1. With normal use at room temperature, a full battery charge can be expected to supply about 4 hours of accumulated working time.
2. The Calculator may be used while its battery is charging.
3. Batteries that have been neither used nor charged for as long as 2 or 3 months will suffer substantial loss of operating time through a tendency to self-discharge. As a general rule, batteries lose about 1% charge per day due to self-discharge, at normal temperatures.
4. For optimum performance and long life:
 - a. Alternate frequently between Battery and AC power.
 - b. Operate at or near normal room temperatures.
 - c. Charge as soon as possible upon appearance of the Low-Battery indicator.
5. Recharge time is 7 hours for a fully discharged battery.
6. The Low-Battery indicator is designed to appear as soon as battery voltage drops to the lowest value that will support optimum performance of the Calculator. Should further discharge occur, through continued operations or self-discharge, the Low-Battery indicator may fail to appear. Do not continue to operate on batteries when this condition is noted, or a damaged battery may result.
7. As a general rule, if improper operation occurs, first try the Calculator with its charger connected. If operation is then normal, this indicates the batteries are low.
8. Do not store the unit in high temperature areas such as the top of radiators or the rear deck of automobiles exposed to the sun. The Calculator will operate satisfactorily over an ambient temperature range of 0 to 50C (32 to 122F) and relative humidity to 95%.

WARRANTY

Bowmar/ALI, Inc. warrants to the purchaser of this new Bowmar Calculator that if the machine or any part thereof in the judgment of Bowmar is proven to be defective in material or workmanship within one year from date of original purchase, such defects will be repaired or replaced (at the Company's option) free of charge for parts and labor.

This warranty does not apply to any product which has been damaged by accident or which has been misused, abused, altered, or repaired by anyone other than Bowmar.

This warranty is in lieu of all other warranties expressed or implied, and no person is authorized to assume for Bowmar any other liability in connection with the sale of this product.

To obtain repairs, the Calculator should be delivered, prepaid, to Bowmar/ALI, Inc. at address shown below. Please enclose \$1.00 with the unit to cover shipping and handling.

ALI SERVICE CENTER
BOX 648
WEST ACTON, MASS. 01720

A920-900/B

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