

SANYO ELECTRONIC CALCULATOR ICC-1418D INSTRUCTION MANUAL



 **SANYO**
A GREAT NAME IN ELECTRONICS

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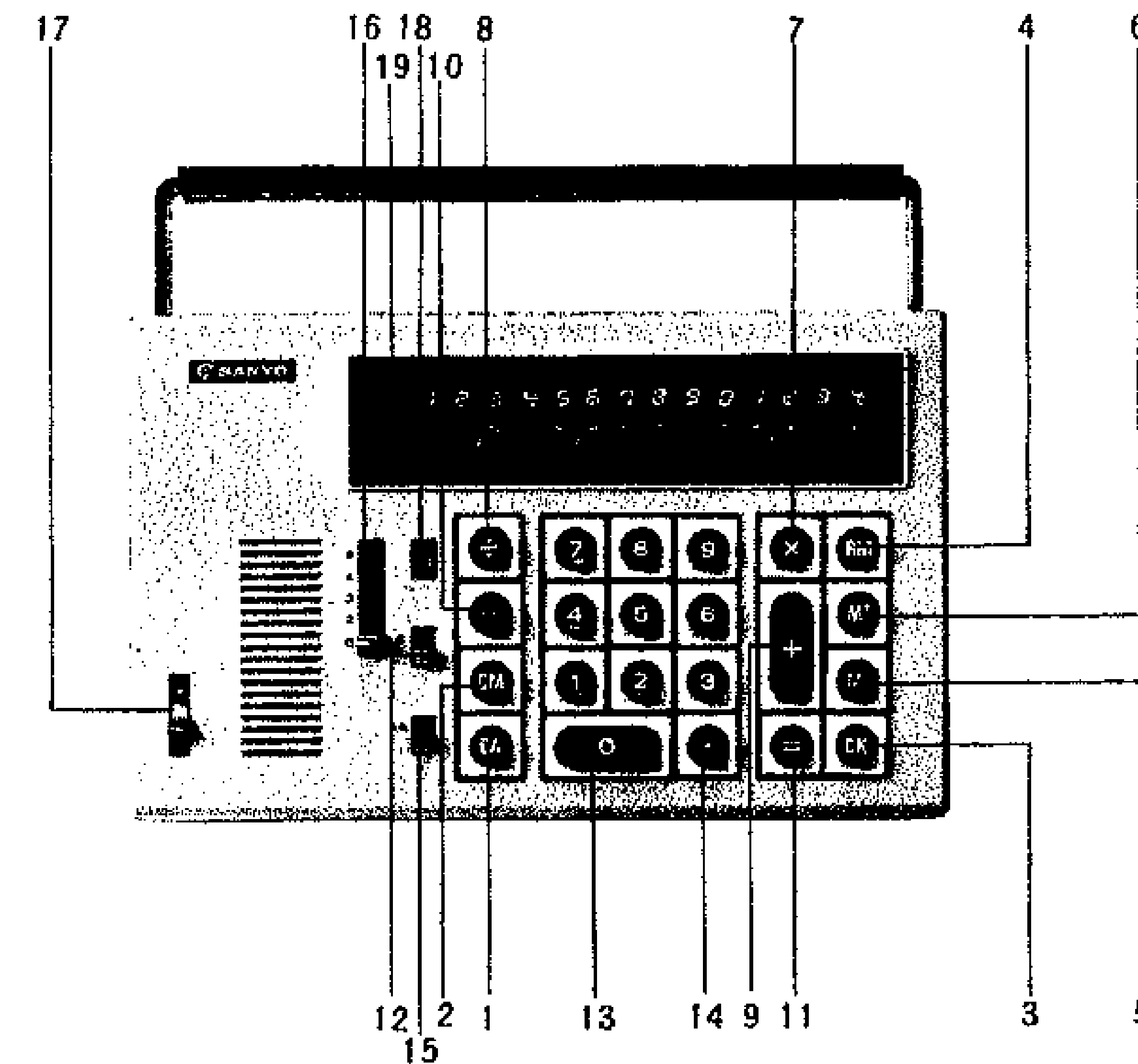
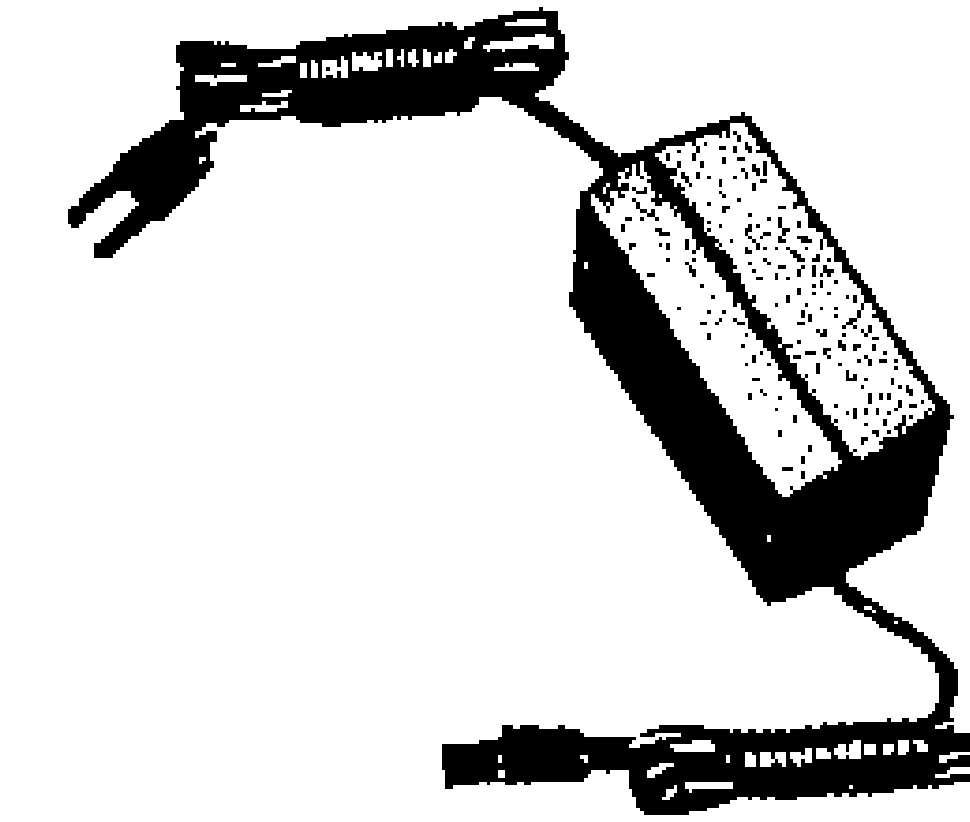
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1. FEATURES

1. Specially designed LSIs
The LSIs, specially designed by Sanyo, insure unsurpassed reliability.
2. Decimal point
The floating input/fixed output system is used allowing the operator to pre-select the decimal position required in the answer, regardless of the number of decimals entered in the problem. Decimal position are 0, 2, 3, 4, and 6 places.
3. Independent memory
A directly addressable memory allows entry of number into the memory. The sigma key allows accumulation of results for Grand Total.
4. Automatic constant
The first number in multiplication and second number in division are automatically set up as a constant.
5. True credit balance with a floating minus sign
Sign appears immediately to the left-most digit number.
6. Round-off/Drop-off switch
By using the round-off switch, all numbers are immediately rounded off.
7. Sequential operation
Chain multiplication or division can be accomplished without the need to attain unnecessary intermediate results.
8. Touch operation
Convenient, fast touch operation can be accomplished due to symmetric keyboard design.


2. NAME OF PARTS

AC adaptor




- | | |
|-----------------------|---|
| 1. Clear all key | 11. Equal key |
| 2. Clear memory key | 12. Sigma switch |
| 3. Clear key | 13. Numeric keys |
| 4. Recall memory key | 14. Decimal point key |
| 5. Memory minus key | 15. Round-off switch |
| 6. Memory plus key | 16. Decimal point selector switch |
| 7. Multiplication key | 17. Power switch |
| 8. Division key | 18. Battery alarm lamp |
| 9. Plus key | 19. Error (over-flow) lamp/Minus sign indicator |
| 10. Minus key | |


3. KEYS AND SWITCHES

- 

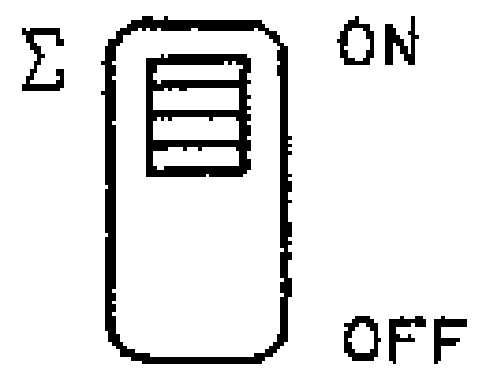
CA
Clear All Key

Clears entire machine except the memory.
- 

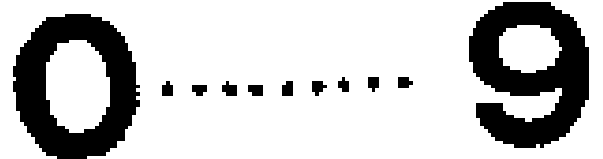
CM
Clear Memory Key

Clears memory.
- 

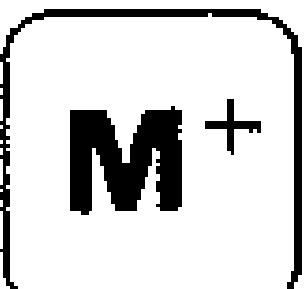
RM
Recall Memory Key

Recalls and displays figure stored in the memory.
- 


Σ ON OFF
Sigma Switch

Use this switch to accumulate totals for Grand Total.
- 

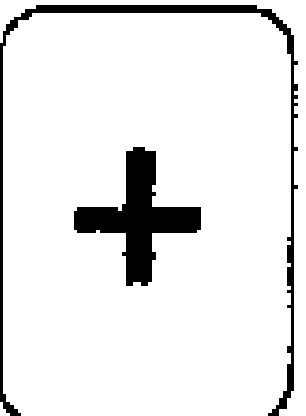
0.....9
Numeric Keys

Figures are indexed by touching these keys and are then displayed on the indicator.
- 

M⁺
Memory Plus Key

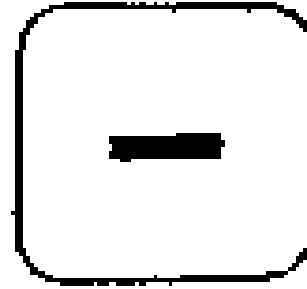
When this key is depressed, the figures displayed are added to the memory and stored in the memory.
- 

M⁻
Memory Minus Key

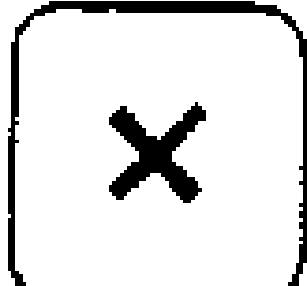
When this key is depressed, the figures displayed are subtracted from the memory and stored in the memory.
- 

+
Plus Key

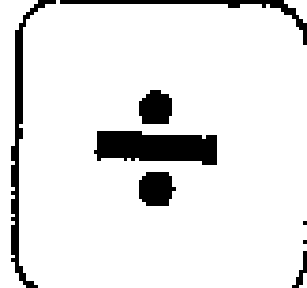
Used for additions. When this key is depressed, the contents of the display are added to the results of the previous calculation and the sum is displayed on the indicator.

- 

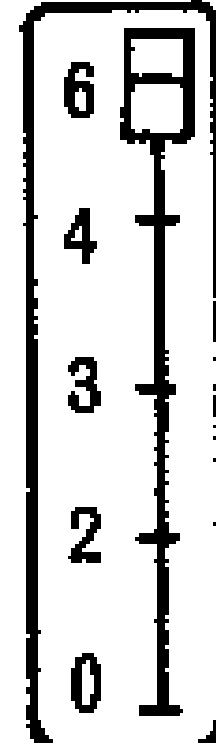
-
Minus Key

Used for subtractions. When this key is depressed, the contents of the display are subtracted from the result of the previous calculation and the difference is displayed on the indicator.
- 

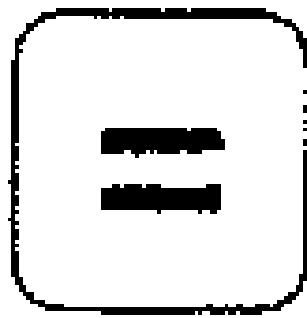
×
Multiplication Key

In multiplications, depress this key after registering the multiplicand. The calculator is then in the multiplication position.
- 

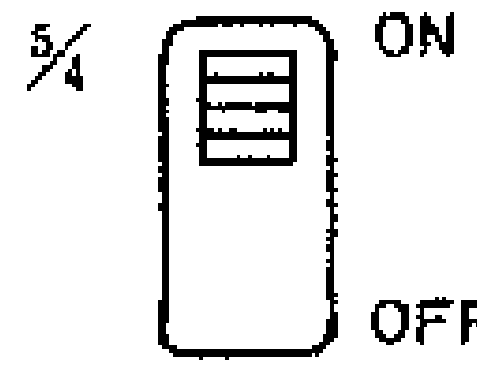
÷
Division Key

In divisions, depress this key after registering the dividend. The calculator is then in division position.
- 

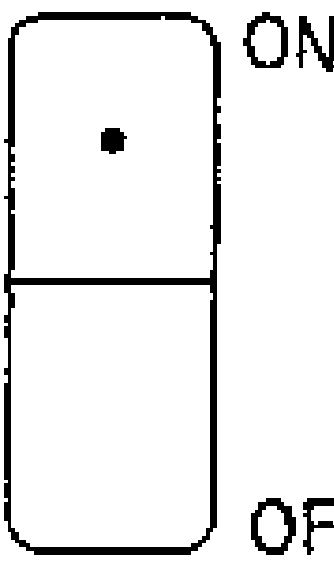
Decimal Point Selector Switch

Pre-select the position of the decimal point with this switch.
- 

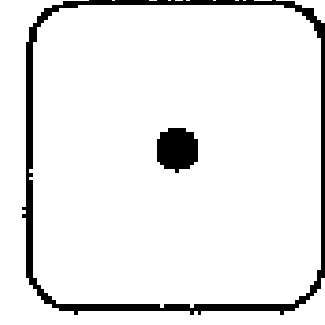
=
Equal Key

Depress this key to obtain final answers. Also clear the working register.
- 

$\frac{3}{4}$ ON OFF
Round-off Key

The last digit displayed on the indicator is result of counting fraction over 1/2 as one and disregarding those below 1/2.
- 

ON OFF
Power Switch



Decimal Point Key

Depress this key at the appropriate position when registering the figures with a decimal point.



Clear Key

Clears only the last figures registered.

4. INDICATORS

1. Figure display

Full size fluorescent tubes. Each figure including the decimal is formed from 9 segments, and the display, controlled by logic circuits, is as shown below.


1234567890.

2. Minus sign

The only time the minus sign indicator lights when the result is a negative figure as shown below.

-123.

3. Error (over-flow) lamp

When a figure or the result of a calculation exceeds capacity of calculator, this lamp lights and further calculation is impossible. Depress the  key to clear the display. The error lamp will light in the following instances:

- a. When a figure registered into the calculator exceeds 14 digits.
- b. In additions and subtractions, when the number of figure registered into the calculator plus the number of pre-selected decimal figures exceed the capacity of calculator.

4. Battery alarm lamp

This lamp shows the condition of the rechargeable Cadnica battery. For further details, refer to the section on Battery Recharging.

5. PREPARATIONS

Prepare for operation in the following order before starting calculations.

1. Turn on the power switch.
2. Confirm that when the **CA** key and **CM** key are depressed, only the first digit shows 0 and the other digits go off.
3. Check if the error lamp lights, when registering a random figure of more than 15 digits.
If there are no anomalies in the above check, try the following simple calculations.

- (1) Set the decimal point selector switch at 2

Operation	Display
1 \cdot 23 +	→ 1.23
456 =	→ 457.23

- (2) Set the round-off switch and the decimal point selector switch at 4.

CA	→ 0
5 \div	→ 5.
9 =	→ 0.5556

- (3) Set the round-off switch and the decimal point selector switch at 3.

1 \cdot 23 ×	→ 1.23
=	→ 1.513

6. CALCULATIONS

1. BASIC CALCULATIONS

1. ADDITION

Ex. $12.3 + 45.67 = 57.97$

CA	→ 0
12 \cdot 3 +	→ 12.30
45 \cdot 67 +	→ 57.97

2. SUBTRACTION

Ex. 1 $24.8 - 11.5 = 13.3$

CA	→ 0
24 \cdot 8 +	→ 24.80
11 \cdot 5 -	→ 13.30

Ex. 2 $18.6 + 24.9 - 14.2 + 3.8 = 33.1$

CA	→ 0
18 \cdot 6 +	→ 18.60
24 \cdot 9 +	→ 43.50
14 \cdot 2 -	→ 29.30
3 \cdot 8 +	→ 33.10

3. MULTIPLICATION

Ex. 1 $123 \times 27 = 3321$

CA	→ 0
123 ×	→ 123.
27 =	→ 3321.

Ex. 2 $-2.5 \times 3 = -7.5$

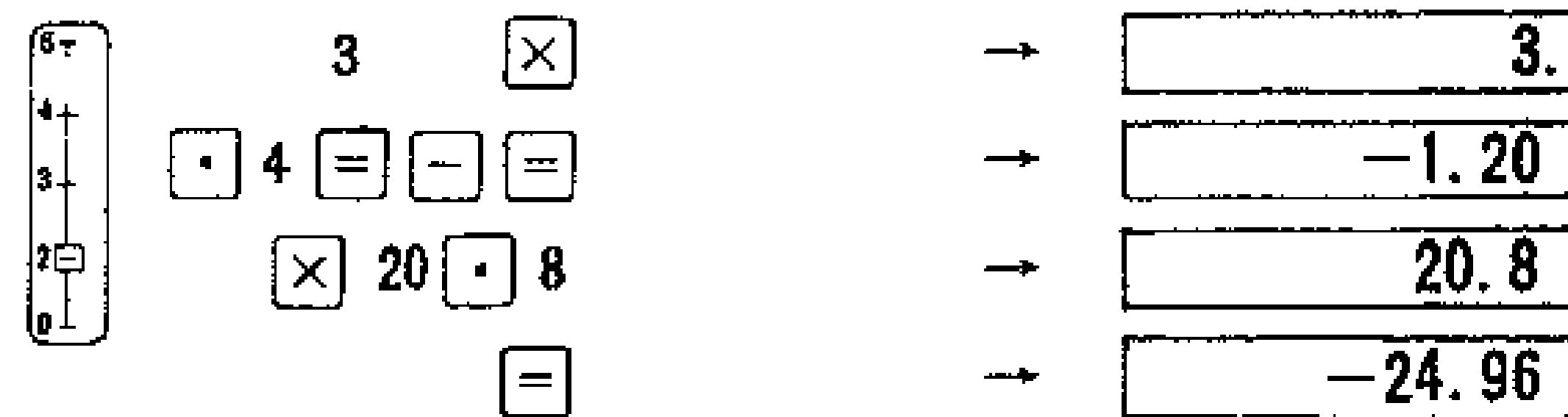


4. SUCCESSIVE MULTIPLICATION

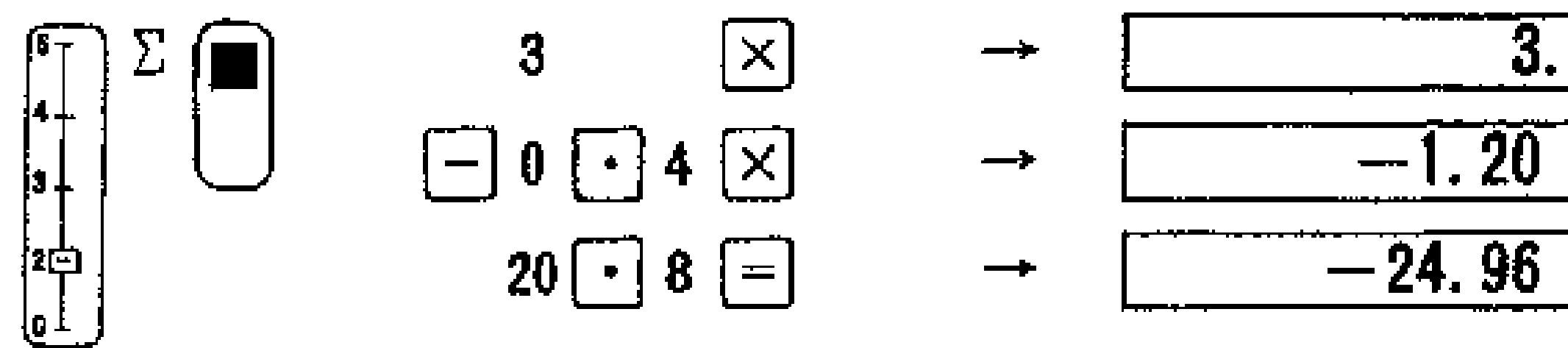
Ex. 1 $12 \times 3 \times 6 = 216$



Ex. 2 $3 \times (-0.4) \times 20.8 = -24.96$



or



NOTE 1 With multiplication or successive multiplication, clearing is automatic and there is no need to depress the **CA** key for each calculations.

NOTE 2 The product must not exceed 14 digits.

NOTE 3 When using **[Σ]** key switch, **[−]** key is used as a exclusive minus entry key.

5. DIVISION

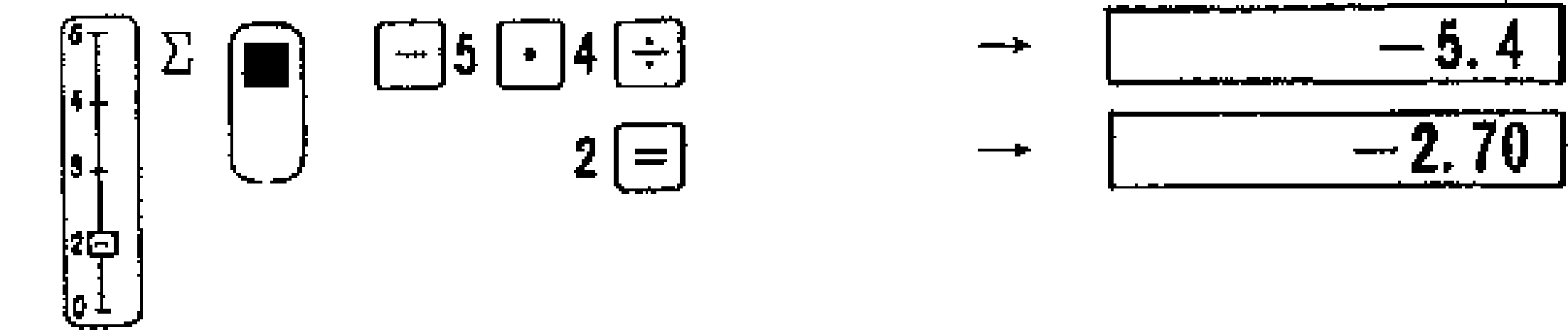
Ex. 1 $625 \div 25 = 25$



Ex. 2 $-5.4 \div 2 = -2.7$



or



Ex. 3 $5 \div 9 = 0.5555$



Ex. 4 Example 3 with round-off switch



6. SUCCESSIVE DIVISION

Ex. $18.2 \div 3.5 \div 2.3 = 2.260869$

	$\frac{1}{2}$ 	18 \cdot 2 \div	\rightarrow	<input type="text" value="18.2"/>
		3 \cdot 5 \div	\rightarrow	<input type="text" value="5.2000"/>
		2 \cdot 3 $=$	\rightarrow	<input type="text" value="2.2609"/>

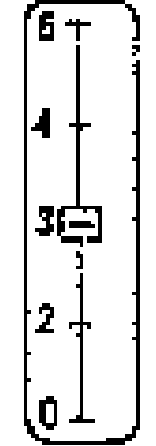
NOTE 1. In division, both dividend and divisor can be registered up to 14 digits.

NOTE 2. With division and successive division, clearing is automatic and there is no need to depress the CA key for each calculations.

II. ADVANCED CALCULATIONS

1. MULTIPLICATION WITH A CONSTANT

Ex. $3.14 \times 2 = 6.28$
 $3.14 \times 3 = 9.42$
 $3.14 \times 2.8 = 8.792$

	3 \cdot 14 \times	\rightarrow	<input type="text" value="3.14"/>
	2 $=$	\rightarrow	<input type="text" value="6.280"/>
	3 $=$	\rightarrow	<input type="text" value="9.420"/>
	2 \cdot 8 $=$	\rightarrow	<input type="text" value="8.792"/>

2. DIVISION BY A CONSTANT

Ex. $56 \div 2.8 = 20$
 $63 \div 2.8 = 22.5$
 $14.7 \div 2.8 = 5.25$

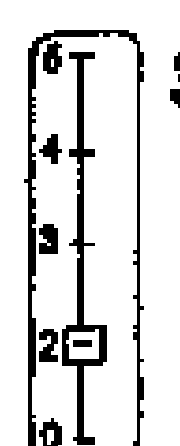
	56 \div	\rightarrow	<input type="text" value="56."/>
	2 \cdot 8 $=$	\rightarrow	<input type="text" value="20.00"/>
	63 $=$	\rightarrow	<input type="text" value="22.50"/>
	14 \cdot 7 $=$	\rightarrow	<input type="text" value="5.25"/>

NOTE 1. In multiplication and division with a-constant, register the constant as multiplicand or divisor.

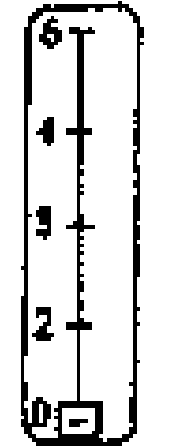
NOTE 2. In these calculations, it is not necessary to depress the \times key or \div key for each calculations. If they are depressed during a calculation, a wrong result will be obtained.

3. MIXED CALCULATION

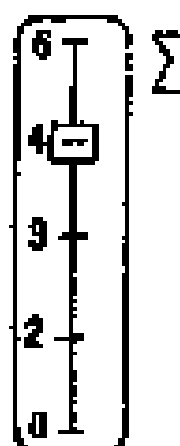
Ex. 1 $3.6 \times 2 \div 8 = 0.9$

	3	·	6	×	→	3.6
			2	÷	→	7.20
			8	=	→	0.90

Ex. 2 $(12 \times 2 \div 3) - 2 + 3 = 9$

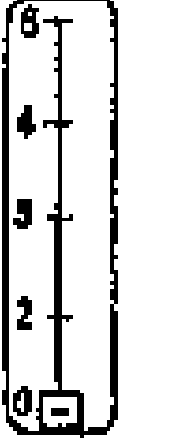
	12	×	→	12.	+	→	8.	
	2	÷	→	24.	2	-	→	6.
	3	=	→	8.	3	+	→	9.

Ex. 3 $\frac{(32 \times 3 + 26 + 96 \times 2) \times 4}{13 \times 3} = 32.20513$

	CA	→	0	26	M ⁺	→	26.0000	
	CM	→	0	RM	→	314.0000		
	32	×	→	32.	×	→	314.0000	
	3	=	→	96.0000	4	÷	→	1256.0000
	96	×	→	96.	13	÷	→	96.6153
	2	=	→	192.0000	3	=	→	32.2051

4. POWER CALCULATION

Ex. 1 $2^5 = 32$

	CA	→	0	
	2	×	→	2.
		×	→	4.
		×	→	8.
		×	→	16.
		=	→	32.

$a^n = z$ (a is positive)

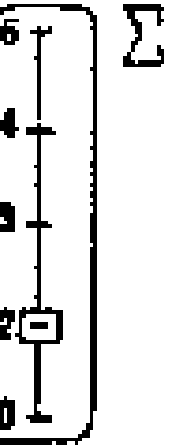
To show this calculation with an equation, it is equivalent to $2 \times 2 \times 2 \times 2 \times 2 = 32$. Therefore, in calculating a^n , the \times key should be depressed (n - 1) times. Especially, if $n = 2, 4, 8, \dots, 2^m$, the \times key and the $=$ key should be depressed m times after registering a.

Ex. 2 $3^6 = 6561$

	CA	→	0	
	3	×	→	3.
		=	→	9.
		×	→	9.
		=	→	81.
		×	→	81.
		=	→	6561.

5. ADDITION AND SUBTRACTION OF PRODUCTS WITH SUBTOTAL AND GRAND TOTAL.

Ex. $2.6 \times 18 = 46.8 (S_1)$
 $3.2 \times 9 = 28.8 (S_2)$
 $-6.9 \times 13 = -89.7 (S_3)$
 Grand total -14.1

	CA	→	0				
	CM	→	0				
	2	·	6	×	→	2.6	
			18	=	→	46.80 S ₁	
	3	·	2	×	→	3.2	
			9	=	→	28.80 S ₂	
	-	6	·	9	×	→	-6.9
			13	=	→	-89.70 S ₃	
		RM	→	-14.10			

NOTE The CA and CM key must first be depressed to clear the result of the previous calculation

6. PRODUCT OF SUM AND DIFFERENCE

Ex. $(47.2 + 29.8) \times (19.2 - 12.6) = 508.2$

6	CA	→	0
4	CM	→	0
2	47 M+	→	47.20
0	29 M+	→	29.80
	19 +	→	19.20
	12 -	→	6.60
	=	→	6.60
	×	→	6.60
	RM	→	77.00
	=	→	508.20

7. ADDITION AND SUBTRACTION OF QUOTIENT WITH SUBTOTAL AND GRAND TOTAL.

Ex. $125 \div 4 = 31.25 (S_1)$
 $628 \div 8 = 78.5 (S_2)$
 $326 \div 20 = 16.3 (S_3)$
 Grand total 126.05

6	CA	→	0
4	CM	→	0
2	125 ÷	→	125.
0	4 =	→	31.25 S ₁
	628 ÷	→	628.
	8 =	→	78.50 S ₂
	326 ÷	→	326.
	20 =	→	16.30 S ₃
	RM	→	126.05

8. QUOTIENT OF SUM AND DIFFERENCE

Ex. 1 $(28 + 46) \div (22 + 31) = 1.396$

6	CA	→	0
4	CM	→	0
2	22 M+	→	22.000
0	31 M+	→	31.000
	28 +	→	28.000
	46 +	→	74.000
	=	→	74.000
	÷	→	74.000
	RM	→	53.000
	=	→	1.396

9. RECIPROCAL CALCULATION

Ex. $\frac{1}{(2+3) \times 4 + 5} = 0.04$

CA	→	0
CM	→	0
2 +	→	2.00
3 =	→	5.00
×	→	5.00
4 =	→	20.00
+	→	20.00
5 =	→	25.00
M*	→	25.00
1 ÷	→	1.
RM	→	25.00
=	→	0.04

III. PRACTICAL CALCULATIONS

I. PERCENTAGE CALCULATION

Ex. Sales breakdown in percentage.

A Dept.	\$ 123,000	→	0
B Dept.	\$ 456,000	→	0
C Dept.	\$ 789,000	→	0
	123000 +	→	123000.000
	456000 +	→	579000.000
	789000 +	→	1368000.000
	=	→	1368000.000
	M*	→	1368000.000
	123000 ÷	→	123000.
	RM	→	1368000.000
	=	→	0.090 A
	456000 =	→	0.333 B
	789000 =	→	0.577 C

2. INCREASE/DECREASE RATE CALCULATION

Ex. The percentage increase/decrease rate of this month's sales (\$ 5,024,000) to last month's sales (\$ 4,238,000).

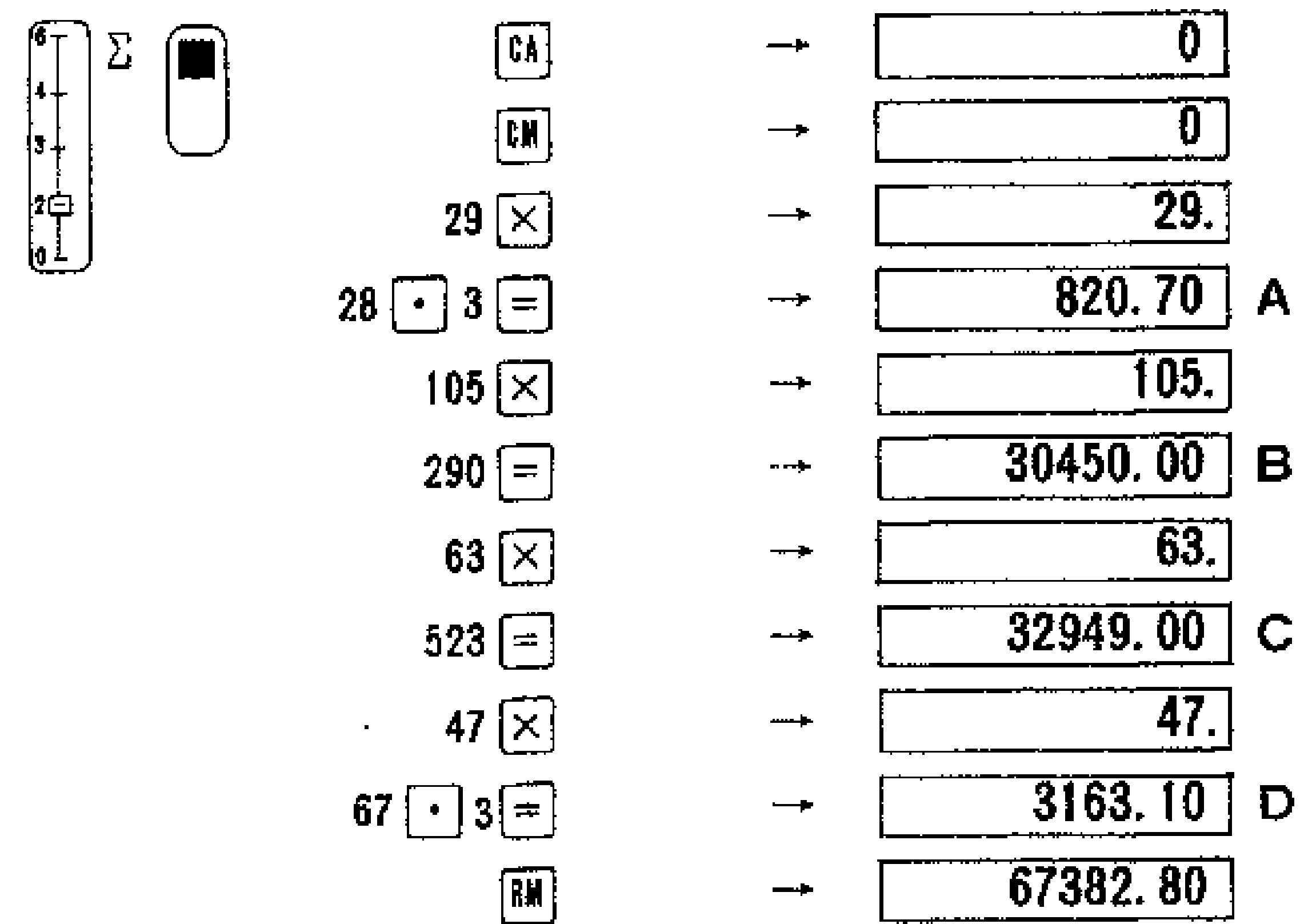
$$\frac{(\text{this month's sales}) - (\text{last month's sales})}{\text{last month's sales}} \times 100 (\%)$$

CA	→	0
CM	→	0
5024000 +	→	5024000.000
4238000 -	→	786000.000
=	→	786000.000
÷	→	786000.000
4238000 =	→	0.185
×	→	0.185
100 =	→	18.500 %

3. INVOICE CALCULATION

Ex. Calculate the sub-totals and grand total of the invoice value.

Item	Quantity	Unit price	Total
A	29	28.30	820.70
B	105	290.00	30,450.00
C	63	523.00	32,449.00
D	47	67.30	3,163.10
Grand total			67,382.80



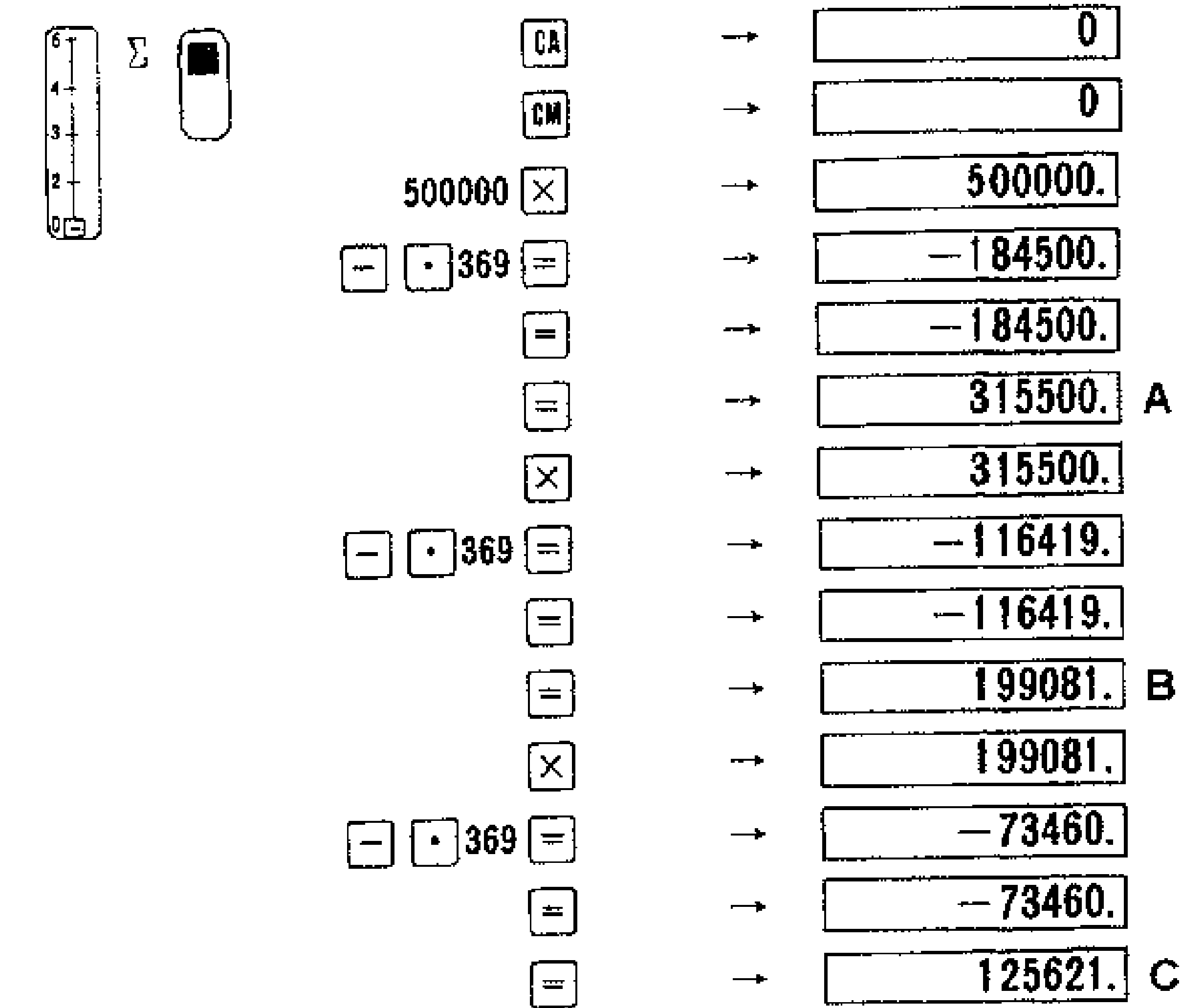
Calculator interface showing the calculation of the invoice total. The display shows 0. The keypad shows the following sequence of operations: CA, EM, 29, ×, 28.30, =, 820.70 (labeled A), 105, ×, 290.00, =, 30450.00 (labeled B), 63, ×, 523.00, =, 32949.00 (labeled C), 47, ×, 67.30, =, 3163.10 (labeled D), 67, ×, 3, =, 3163.10, RM, =, 67382.80.

4. DEPRECIATION CALCULATION

Ex. Obtain the price of fixed assets as booked at the end of each period (cost : \$500,000, Life : 5 years, depreciation rate : 0.369)

1st year $500,000 - (500,000 \times 0.369) = A$
 2nd year $A - (A \times 0.369) = B$
 3rd year $B - (B \times 0.369) = C$
 4th year $C - (C \times 0.369) = D$
 5th year $D - (D \times 0.369) = E$

(Quantities in parenthesis are the depreciation of a corresponding year)



Calculator interface showing the depreciation calculation. The display shows 0. The keypad shows the following sequence of operations: CA, CM, 500000, ×, 0.369, =, 184500.00, -, 500000, =, 315500.00 (labeled A), ×, 0.369, =, 116419.00, -, 315500.00, =, 199081.00 (labeled B), ×, 0.369, =, 73460.00, -, 199081.00, =, 125621.00 (labeled C).

5. PROPORTIONAL DIVISION

Ex. Divide the profits (\$ 78,000) among stores in proportion to their sales.

A Store \$45,000
 B Store \$34,000
 C Store \$23,000

6	CA	→	0
4	CM	→	0
3	+	→	45000.000
2	+	→	79000.000
0	+	→	102000.000
	=	→	102000.000
	M*	→	102000.000
78000	÷	→	78000.
	RM	→	102000.000
	=	→	0.764
	×	→	0.764
45000	=	→	34380.000 A
34000	=	→	25976.000 B
23000	=	→	17572.000 C

6. PROBABILITY CALCULATION

Ex. Obtain the probability that the "10", "Jack", "Queen", "King", and "Ace" of Hearts can be collected the first try in a bridge game.

$$P = \frac{5}{52} \times \frac{4}{51} \times \frac{3}{50} \times \frac{2}{49} \times \frac{1}{48}$$

6	CA	→	0
4	52 ×	→	52.
3	51 ×	→	2652.
2	50 ×	→	132600.
0	49 ×	→	6497400.
	48 ÷	→	311875200.
	5 ÷	→	62375040.
	4 ÷	→	15593760.
	3 ÷	→	5197920.
	2 =	→	2598960.

That is, the chance comes once in 2,598,960 times.

7. CREDIT LOAN PAYMENT CALCULATION

Ex. Obtain each of 10 monthly installments for a \$ 318,000 loan borrowed at the interest rate of 2.3% per month.

$$R = P \times \frac{i}{1 - (1+i)^{-n}} = 318000 \times \frac{0.023}{1 - \frac{1}{1.023^{10}}}$$

6	CA	→	0
4	CM	→	0
3	0.023	→	1.023
2	×	→	1.0465
1	×	→	1.0705
0	×	→	1.0951
	×	→	1.1202
	×	→	1.1459
	×	→	1.1722
	×	→	1.1991
	×	→	1.2266
	=	→	1.2548
	M+	→	1.2548
	1 ÷	→	1.
	RM	→	1.2548
	=	→	0.7969
	-	→	-0.7969
	1 +	→	0.2031

=	→	0.2031
CM	→	0.2031
M+	→	0.2031
0.023 ÷	→	0.023
RM	→	0.2031
=	→	0.1132
×	→	0.1132
318000 =	→	35997.6000

8. SIMPLE INTEREST/COMPOUND INTEREST CALCULATION

Ex. \$ 10,000 is invested at 5.5% per annum.
Total assets after five years are to be calculated with simple interest and compound interest.

(a) Simple interest

$$\text{Total assets} = (\text{Original investment}) \times (1 + \text{annual interest} \times \text{years})$$

$$= 10,000 \times (1 + 0.055 \times 5)$$

	→	0
	→	0.055
	→	0.275
	→	0.275
	→	1.275
	→	1.275
	→	1.275
	→	12750.000

(b) Compound interest

$$\text{Total assets} = (\text{Original investment}) \times (1 + \text{annual interest})^{\text{years}}$$

$$= 10,000 (1 + 0.055)^5$$

	→	0
	→	1.000
	→	1.055
	→	1.055
	→	1.055
	→	1.113
	→	1.174
	→	1.238
	→	1.306
	→	1.306
	→	13060.000

9. HIGH-POWER MULTINOMIAL CALCULATION

Ex. $y = 3x^4 + 6x^3 - 8x^2 + x - 1$

Calculate y when $x = 8$.

	→	0
	→	0
	→	8.
	→	64.
	→	512.
	→	4096.
	→	12288.
	→	8.
	→	64.
	→	512.
	→	3072.
	→	8.
	→	64.
	→	-512.
	→	8.
	→	1.
	→	14855.

8. BATTERY RECHARGING

- * Recharge before using for the first time.
- * Built-in lifetime rechargeable CADNICA batteries.
The Cadnica batteries are rechargeable, small, hermetically sealed cells. They never need replacing and are handy and economical in use.
- * Recharging procedure
 1. Insert adaptor AC plug into power socket.
 2. Insert adaptor DC plug into three pin socket as far as it will go.
 3. Recharging takes place whether the power switch is ON or OFF and recharging is possible even when the calculator is in use.
- * Recharging time
Recharging of totally exhausted batteries takes at least 15 hours at power switch off.
- * Battery alarm lamp

Lamp	Battery condition
Light-off	Recharging unnecessary
Light-on	Recharging absolutely necessary

9. SPECIFICATIONS

Type	Electronic desk top calculator
Model	ICC-1418D
Numeric key	10-key system
Display	Full size fluorescent tubes, with zeros suppression, error lamp, minus sign, battery alarm lamp.
Decimal point	Floating input/Fixed output (0, 2, 3, 4, 6) round-off / drop-off
Memory	1 memory
Capacity	Add/sub. Max. 14 digits \pm 14 digits Multiplication: Multiplicand + Multiplier \leq 15 digits Products Max. 14 digits Division: Dividend: Max. 14 digits Divisor: Max. 14 digits Quotient: Max. 14 digits
Functions	4-rules, successive multi. and div., constant multi. and div., mixed calculation, power calculation, products sum and difference, reciprocal calculation, memory calculation, applied calculations and others.
Components	Mos-LSIs, Hybrid-ICs
Operating temp.	0° ~ 40°C (32°F - 104°F)
Power supply	Adaptor : AC Local voltage \pm 10% 50/60 Hz Calculator : DC 6.2 V, 7.8V
Power consumption	Adaptor : AC 8W Calculator : DC 4.5W
Dimensions	60(H) x 226(W) x 140(D) mm 2-3/8(H) x 8-15/16(W) x 5-9/16(D) inch
Weight	1.3 kg (2 lbs.14ozs.)



A GREAT NAME IN ELECTRONICS

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