ENTRPREX
2110
"FINANCIER"

ELECTRONIC CALCULATOR 10
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Instructions

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FOREWORD

Your calculator Financier has been designed to perform the four basic arithmetic functions which most ordinary calculators perform and, also, to quickly solve the common financial problems which normally require the use of tables, complex formulae or sophisticated data processing equipment. Among its capabilities are the following:

1. Duplicate any required portion of compound interest and annuity or loan amortization tables (i.e., compute payments, present value, final value, or number of periods).
2. Make retailing or securities related margin calculations.
3. Extrapolate a trend into the future using a linear regression technique.
4. Calculate square roots.
5. Compute an average, sum or sum of the squares while recording the number of data points entered.
6. Calculate percentages, marked-up amounts, discounted amounts or percentage change.

The user has the option of selecting business logic, as used in mechanical adding machines, or the more natural algebraic logic. He also has an option to have results displayed with zero to seven decimal places.

This intruction manual provides the information necessary for the care and operation of your calculator Financier. It also provides some practice examples which will enable you to gain proficiency in the use of your new calculator and additional insight into the many types of problems it can solve.

GENERAL INFORMATION

Your calculator can operate on size "AA" Alkaline batteries or ordinary UM-3 chemical batteries. Alkaline batteries will give a much longer battery life.

Install the batteries into the battery compartment. Be careful the polarities are correct. The negative side of the batteries always contacts the coil-spring electrode. The other side is positive. Wrong polarity will damage the calculator, and so, make sure that battery polarities are correct. If calculator is to be put away for a long period, remove the batteries! Aged or exhausted batteries will damage the calculator severely! Any damage thus incurred does not come under the warranty of this calculator!

AC adaptor can be used. Plug the male adaptor plug into calculator female jack. Plug the adaptor into AC mains. Be sure that the AC mains is correct for the corresponding adaptor. The DC output of the adaptor should be 3 volts 150MA and the center pin of the male plug should be negative in polarity.

BASIC OPERATIONS

DISPLAY

Numbers with an absolute value of 0.0000001 to 99999999 can be displayed. Negative results are indicated by the minus light. Results in excess of eight digits are indicated by the overflow light. The eight most significant digits are displayed with the decimal adjusted eight places to the left of the correct position. For numbers less than one, a zero is displayed to the left of the decimal point, but no leading zeros are displayed for larger numbers. The results of the calculations are displayed instantaneously for most calculations; however, as explained later, a delay occurs for some complex problems.

EXPLANATION OF KEYS

All keys except one, (COMP), have two functions. The following table describes the basic functions of each key. Symbols or numbers in this instruction manual printed with boxes or on the left side of the (/) sign denote the basic function of a key. Symbols in parentheses ( ) denote the function printed after the stroke such as (+/Σ), (6/FV), as described in the ADVANCED OPERATIONS section. In (+/Σ) key, the [+] is the basic function of this key, and (Σ) is the other function. Same with [6] and (FV).

ALG ▭ BUS SWITCH Alg-Algebraic, Bus-Business.
You can choose to use algebraic mode or business mode as you wish by switching to proper mode indicated on the switch. The difference will be explained clearly later in actual examples.

[0] – [9] Data entry keys.

[·] Decimal point key.

[+] Plus Key.

Algebraic Logic

To add A + B, enter A and depress [+], then enter B and depress [=]. The sum is displayed. Depressing [+] performs the previously established condition (if any), then prepares the calculator to add the number in the display to the next entry when [+], [–], [x], [÷], or [=] is depressed.

Business Logic

1) Performs addition.

2) When depressed after [%], adds a percentage of a number to itself (e.g. sales tax).

[–] Minus Key.

Algebraic Logic

To subtract A – B, enter A and depress [–] , then enter B and depress [=] . The difference is displayed. Depressing [–] performs the previously established condition (if any), then prepares the calculator to subtract the next number entered from the number in the display after [+] , [–] , [x] , [÷] , or [=] is depressed.

Business Logic

1) Performs subtraction.
2) When depressed after [%] , subtracts a percentage of a number from itself (e.g. discounts).

[x] Multiplication Key.

Algebraic Logic

To multiply A x B, enter A and depress [x] , then enter B and depress [=] . The answer is displayed. Depressing [x] performs the previously established condition (if any), then prepares the calculator to multiply the number in the display by the next number entered when [+] , [–] , [x] , [÷] , or [=] is depressed. If [%] is depressed, B is treated as percent.

Business Logic

Prepares the calculator to multiply, to perform chain multiplication, and to establish the first factor as a constant multiplicand.

[÷] Division Key.

Algebraic Logic

To divide A ÷ B, enter A and depress [÷] , then enter B and depress [=] . The answer is displayed. Depressing [÷] performs the previously established condition (if any), then prepares the Calculator to divide the number in the display by the next entry when [+] , [–] , [x] , [÷] , or [=] is depressed. If [%] is depressed, B is treated as percent.

Business Logic

Prepares the calculator to divide, to perform chain division and to accept the next factor as a constant divisor if [=] is depressed.

[=] Equals Key.

Algebraic Logic

Depressing [=] performs the previously established condition, establishes a constant, then terminates the calculation. The constant number is the last entry made before depressing [=] . The constant function is the last function key [+] , [–] , [x] , or [÷] depressed before depressing [=] . The constant operation may be performed on an entry simply by depressing [=] after the entry.

CALCULATOR LOGIC EXPLANATION

To operate the calculator correctly can to get the maximum benefit please read the following carefully before trying to calculate. Perfect understanding of the logic of the calculator will enable you to get the most out of the calculator in the shortest possible time.

First, there are four registers in the calculator. "A", "B", "N" and "I".

Register "A". This register stores the "payment".
Register "B". This register stores the "present value" or the "future value".
Register "N". This register stores the "number of periods".
Register "I". This register stores the "interest rate per period." (period can be months or years).

Assume you have a number to enter. You press the keys and enter the number and the number is now on the display. The calculator does not know what to do with this number. So, you must instruct the calculator what it is. First you press [ENT] (enter). Now, the number has been entered into the "B" memory register. Still, the calculator does not know what that number is, although the numericals are known. Again, you press the button you require, such as [PV] "present value". Now the calculator knows that the number you entered represents the number of dollars or some other currencies you have at the "present time". Memory register "B" is now full, or used up and no more numbers should be entered into it. Next, let us assume that you intend to lend this "present sum" to some one for 5 years at the compounded interest rate of 8% per annum, and you want to know what sum should be returned to you after 5 years. Therefore, you press the key [8] and [ENT] (enter). Now the number [8] had been entered into the register. Again, it does not know what the number is for. Therefore, you press the key [i], (interest per year). The memory register now recognizes the number as interest rate per year. Now, you press the key [5] and [ENT]. By the same logic, press the (n) period key, and this represents the length of time. The "N" register now recognizes the number 5 is the period, or number of years under consideration. All factors are now known to the calculator. Press the [COMP], (compute), and the calculator starts to compute. But compute for what? Again you instruct the calculator by pressing the key (FV) (final value). The answer on the display is now the correct sum to be returned to you after 5 years with 8% compounded interest! You understand now how the calculator works and remembers and you should be able to put the calculator to its full use. It can save lots of time for you! As you can see, the calculator works logically. But, you must know the calculator's logic and instruct it accordingly.

Business Logic

1) Completes a multiplication or division problem.
2) Prepares the calculator to begin a new addition or subtraction problem. (Note: It's necessary to depress [+] or [−] after entering the last figure, before depressing [=]).

[%] Percent Key.

Algebraic Logic

The operation of the [%] key depends upon the condition which is active at the time of depression.

When either the multiply or divide condition is active, the [%] key operates like the [=] key with the completed result divided by 100 or multiplied by 100, respectively.

When the add or subtract condition is active, an automatic mark-up or discount is performed. A multiply is performed with the product divided by 100 and add or subtract condition remains set so that the next arithmetic operation key ([+] , [−] , [x] , [÷] , or [=]) performs a mark-up (add-on) or discount (depending on the active condition-addition or subtraction).

Business Logic

Calculates percentage calculations. When used as an equals key in multiplication or division, this key allows you to enter a factor as a percent instead of as a decimal.

[C] Clear Key

1) A single depression of [C] , when there is no overflow condition, clears the displayed number, but does not affect the stored constants or the calculating mode.
2) A double depression of [C/CA] , clears any calculating mode and clears the calculator except the memories.
3) Depressing [C] during an overflow (see ERROR CONDITIONS, Page 31) cancels the error condition. The resulting number in the display will be correct if multiplied by 10^8, and may be used in further calculations. Depressing [C] once will clear the overflow but not clear the display or any other conditions, so that you can continue to calculate. Depressing [C] twice clears the entire calculator (except the memories) so that you can start a fresh calculation. Chain and constant modes are not affected by overflowing.
4) Clearing of memories is explained under ADVANCED OPERATIONS.

As stated, this is a sophisticated instrument, and not as simple to use as a normal 4 function calculator. But once you master the principles of operation, it can solve many difficult problems for you in a matter of seconds. So, learn how to use this calculator carefully and put it to its full use.

It must be noted that in the instructions which follow if [ENT] (READ) keys are called for [ENT/READ] must be depressed TWICE otherwise calculations will be wrong.

ADDITION AND SUBTRACTION — LOGIC SELECTION

Addition and subtraction may be performed in either business (adding machine) logic or algebraic logic. The selection is made by placing switch in the appropriate position. The example 7 + 8 − 9 = 6 illustrates the two types of logic.

Key in		Display
Business Logic	Algebraic Logic	
7 [+]	7	7
8	[+] 8	8
[+]	[−]	15
9	9	9
[−]	[=]	6

Note that business logic requires that the sign associated with a number be entered after the number. In algebraic logic, number entries are made in the same way an algebraic problem would be stated, i.e., 7 + 8 − 9 = 6. In business logic, depression of the [+] or [−] key performs the operation indicated and displays the answer. In algebraic logic, depression of either of these keys performs the operation indicated by the most recently depressed arithmetic function key and sets up the next operation. Depression of the [=] key completes the sequence by performing the operation commanded by the last function key depressed.

The logic selection switch affects only addition, subtraction, mixed calculations, repeat and constant multiplication, and automatic mark-up or discount operations. The latter are explained in the appropriate sections.

REPEATED ADDITION AND SUBTRACTION

Example: Solve 5 − 6 − 6 − 6 = −13

Key in		Display
Business Logic	Algebraic Logic	
5 [+]	5	5
6	[−] 6	6
[−]	[−]	1 minus
[−]	[−]	7 minus
[−]	[=]	13 minus

A basic chained addition/subtraction problem has been illustrated in the Logic Selection section. In addition to chained operations, repeated operations can be performed through successive depressions of the [+] or [−] keys. The last number entered is added or subtracted repeatedly.

CONSTANT ADDITION AND SUBTRACTION

In the algebraic logic, addition or subtraction of a constant from a series of numbers can be performed by entering new addends or minuends (first number entered) and depressing the equal key. The second number is saved as a constant.

Example: Solve 9 − 3 = 6
7 − 3 = 4
5 − 3 = 2

Algebraic Logic

Key in	Display
9	9
[−] 3	3
[=]	6
7	7
[=]	4
5	5
[=]	2

MULTIPLICATION AND DIVISION

Multiplication and division problems are entered in the same way an algebraic equation would be stated regardless of the logic select switch position.

Example: Solve $4 \times 9 = 36$

Key in	Display
4	4
[x] 9	9
[=]	36

Example: Solve $19 \div 2 = 9.5$

Key in	Display
19	19
[÷] 2	2
[=]	9.5

REPEATED MULTIPLICATION AND DIVISION

Repeated multiplications or divisions by the same number can be performed by successive depressions of the multiply or divide key. The multiplier or divisor need not be repeatedly entered.

Example: Solve $4^3 = 64$

Key in	Display
4	4
[x] [x]	16
[=]	64

If two numbers are entered, the first is saved as a constant multiplicand in business logic, the second as a constant multiplier in algebraic logic. For division, the last entry (divisor) is retained in either case.

Example: Solve $\frac{3 \times 6^3}{4 \times 3^3} = 6$

Business Logic Key in	Display	Algebraic Logic Key in	Display
6	6	3	3
[x] 3	3	[x] 6	6
[x]	18	[x]	18
[x]	108	[x]	108
[÷]	648	[÷]	648
4	4	4	4
[÷]	162	[÷]	162
3	3	3	3
[÷]	54	[÷]	54
[÷]	18	[÷]	18
[=]	6	[=]	6

CONSTANT MULTIPLICATION AND DIVISION

Multiplication or division of a series of numbers by a constant can be performed in algebraic logic by entering a new multiplicand or dividend (first number entered) and depressing the equal key. The second number entered (multiplier or divisor) is saved as a constant. In business logic, constant division is identical. However, the first number entered is saved as a constant multiplicand.

Example: Solve $4 \times 3 = 12$
$5 \times 3 = 15$
$6 \times 3 = 18$

Business Logic Key in	Display	Algebraic Logic Key in	Display
3	3	4	4
[x] 4	4	[x] 3	3
[=]	12	[=]	12
5	5	5	5
[=]	15	[=]	15
6	6	6	6
[=]	18	[=]	18

Example: Solve 5 ÷ 4 = 1.25
6 ÷ 4 = 1.5
8 ÷ 4 = 2

Business Logic Key in	Business Logic Display	Algebraic Logic Key in	Algebraic Logic Display
5	5	5	5
[÷] 4	4	[÷] 4	4
[=]	1.25	[=]	1.25
6	6	6	6
[=]	1.5	[=]	1.5
8	8	8	8
[=]	2	[=]	2

RECIPROCALS

You have performed a series of calculations which have resulted in a displayed answer of 1.4285714. You want the reciprocal of this number without the tedium of re-entering the number.

Key in	Display
1.4285714	1.4285714
[÷]	1.4285714 (assumes decimal set is 7)
[÷]	1
[=]	0.7000000

PERCENTAGE CALCULATIONS

Multiplication or division by a percentage is performed by using the [%] key in place of the [=] key. The results of a multiplication are automatically divided by 100 and the results of a division are automatically multiplied by 100.

Example: Solve 50 x 30% = 15

Key in	Display
50	50
[x] 30	30
[%]	15

Example: Solve 32 ÷ 40% = 80

Key in	Display
32	32
[÷] 40	40
[%]	80

AUTOMATIC MARK-UP OR DISCOUNT

An amount can be automatically marked up or discounted a specified percentage.

Example: Discount an item costing $19.95 by 15% and then add a 5% sales tax.

Key in				Display	Comment
Business Logic		Algebraic Logic			
	19.95		19.95	19.95	
[x]	15	[−]	15	15	
	[%]		[%]	2.99	Discount
	[−]		[=]	16.96	Discounted amount
[x]	5	[+]	5	.5	
	[%]		[%]	0.85	Tax
	[+]		[=]	17.81	Net Price

MIXED CALCULATIONS

Business Logic

In business logic, addition, subtraction, multiplication and division can be intermixed in any desired sequence.

Example: Solve $\frac{(9 + 6) \times 0.85 - 4}{4} = 2.19$

Key in	Display
9 [+]	9
6	6
[+]	15
[x] .85	0.85
[=] [+]	12.75
4	4
[−]	8.75
[÷] 4	4
[=]	2.19

Algebraic Logic

In algebraic logic, addition, subtraction, multiplication, division and percentage operations can be intermixed in any desired sequence.

Example: Solve $\frac{(9 + 6) \times 85\% - 4}{4} = 2.19$

Key in	Display
9	9
[+] 6	6
[x]	15
85	85
[%]	12.75
[−] 4	4
[÷]	8.75
[=]	2.19

Note the inherent greater efficiency of the algebraic logic for mixed calculations. Algebaric logic required 11 key depressions to solve a problem which required 15 key depressions using business loigc.

ADVANCED OPERATIONS

Secondary or alternate function designators are indicated above all keys except [COMP]. The secondary function is made operative by a prior depression of either the [ENT] key or the [COMP] key.

DECIMAL SELECTION

Example: Round the results of 2/3 to 4, then 6 decimal places.

Key in	Display
2	2
[÷] 3	3
[=]	0.67
[COMP] or [ENT]	0.67
(DP)	0.67
4	0.6667
[COMP] or [ENT]	0.6667
(DP)	0.6667

Unless commanded otherwise, the calculator will provide results rounded to two decimal places. To select any other number of decimal places from 0 to 7, simply depress either the [COMP] or [ENT] key, then the (DP) key, then the number of decimal places desired. The decimal select remains set until a change is commanded or the machine is turned off.

CHANGE SIGN

To change the sign of a displayed number, depress either the [ENT] or the [COMP] key followed by the (+/−) key.

SQUARE ROOT

To calculate a square root of a displayed number, depress either the [ENT] or the [COMP] key followed by the ($\sqrt{\ }$) key. If the negative indicator is lit, the condition ignored by the calculator and the square root of the absolute value is computed.

Example: Find the square root of 2 to five decimal places.

Key in	Display
2	2
[ENT] or [COMP]	2
($\sqrt{\ }$)	1.41 (answer rounded to 2 decimal places)
[ENT] or [COMP]	1.41
(DP)	1.41
5	1.41421 (answer rounded to 5 decimal places)

MEMORY OPERATIONS

The calculator has four memories, designated A, B, N and I. These memories are accessed through the use of financial, margin, or trend line calculation keys and are also modified by the (Σ) key. Four types of operations can be performed on these memories:

1) Store: replace the contents of the memory with the displayed number.
2) Accumulate: add the displayed number or a function of the displayed number to the contents of the memory.
3) Read: cause the contents of the memory to be displayed.
4) Clear: store zero in the memory.

Memory A Access Keys:

(TREND)	(Store or read)
(SELL)	(Store or read)
(PMT)	(Store or read)
(Σ)	(Accumulate only)
(CA)	(Clear all memories)

Memory B Access Keys:

(TL)	(Store or read)
(PV)	(Store or read)
(FV)	(Store or read)
(COST)	(Store or read)
(Σ)	(Add the square of the displayed number)
(CA)	(Clear all memories)

Memory N Access Keys:

(Limited to whole numbers of 4 digits or less)

(n)	(Store or read)
(Σ)	(Adds 1 and displays the result)
(CA)	(Clear all memories)

Memory I Access Keys:

(i)	(Store or read) Interest per period.
(i/yr)	(Store or read 12i) Interest per year already divided into monthly periods. The calculator understands that the number entered in the interest rate per year but it automatically divides it into monthly periods. Therefore you must use number of months as the period and the interest is compounded monthly.
(CA)	(Clear all memories)

The memory access keys are labeled to facilitate their use in financial calculations. However, these keys can be used for any problem requiring temporary storage of a* result while other portions of a problem are solved.

To store a displayed number in one of the memories, depress the [ENT] key followed by the appropriate memory key. To read (display) the contents of a memory, depress [ENT] and (READ) keys, followed by the appropriate memory. To accumulate (add) to memory A, depress the [ENT] key followed by the (Σ). The operation also automatically accumulates the sum of the squares of the displayed numbers in memory B, counts the number of entries in memory N and displays the contents of memory N. When using the (Σ) key, all memories must be cleared by a [COMP] (CA) operation to ensure they are zero when starting.

*If large numbers are entered via the (Σ) key, memory B, which stores the sum of the squares may overflow quickly (see Appendix B).

Example 1: Multiplying or Dividing Sums and/or Differences

Solve $(5 + 3) \times (4 - 9) = -40$

Business Logic

Key in	Display
5 [+]	5
3	3
[+] [ENT] (i)	8
[C]	0
4 [+]	4
9	9
[–]	5
[x] [ENT] (READ) (i)	8
[=]	40 minus

Algebraic Logic

Key in	Display
5	5
[+] 3	3
[=] [ENT] (i)	8
4	4
[–] 9	9
[x]	5 minus
[ENT] (READ) (i)	8
[=]	40 minus

Example 2: Adding or Subtracting Products or Quotients

Solve $\frac{(7 \times 8) + (6 \times 2)}{(12 \times 14) - (3 \times 18)} = 0.596491$

Key in: Business Logic	Key in: Algebraic Logic	Display	Comments
7	7	7	
[x] 8	[x] 8	8	
[=]	[=]	56	
[ENT] (PMT)	[ENT] (PMT)	56	56 into memory A
6	6	6	
[x] 2	[x] 2	2	
[=] [+]	[+]	12	
[ENT] (READ) (PMT)	[ENT] (READ) (PMT)	56	Memory A read into display
[+]	[=]	68	12 + 56
[ENT] (PMT)	[ENT] (PMT)	68	68 replaces 56 in memory A
12	12	12	
[x] 14	[x] 14	14	
[=]	[=]	168	
[ENT] (PV)	[ENT] (PV)	168	168 into memory B
3	3	3	
[x] 18	[x] 18	18	
[=]	[+]	54	
[−]	[ENT] (+/−)	54 minus	
[ENT] (READ) (PV)	[ENT] (READ) (PV)	168	
[+]	[=]	114	168 − 54 (Contents of memory B are added to display
[÷] [ENT] (READ) (PMT)	[÷] [ENT] (READ) (PMT)	68	
[=]	[=]	1.68	144/68 (reciprocal of answer)
[÷] [÷]	[÷] [÷]	1	
[=]	[=]	0.60	Answer rounded to 2 places
[ENT] (DP) 6	[ENT] (DP) 6	0.596491	Answer to 6 places

Example 3: Accumulating in Memory A

Solve $(13 \times 19) + (8 \times 21) + 17^2 = 704$

Business or Algebraic Logic

Key in	Display	Comment
[COMP] (CA)	0	Clears all memories
13	13	
[x] 19	19	
[=]	247	
[ENT] (Σ)	1	247 in memory A, 1 in memory N
8	8	
[x] 21	21	
[=]	168	
[ENT] (Σ)	2	415 in memory A, 2 in memory N
17	17	
[x] [=]	289	
[ENT] (Σ)	3	704 in memory A, 3 in memory N
[ENT] (READ) (PMT)	704	Displays contents of memory A

Example 4: Accumulating Squares in Memory B

The hypotenuse of a right triangle is equal to the square root of the sum of the squares of the two sides of the triangle. If the sides adjacent to the right angle are 7 and 9, what is the hypotenuse?

$$\sqrt{7^2 + 9^2} = 11.4$$

Business or Algebraic Logic

Key in	Display	Comment
[COMP] (CA)	0	Clears all memories
7	7	
[ENT] (Σ)	1	$7^2 = 49$ in memory B, 1 in memory N
9	9	
[ENT] (Σ)	2	$7^2 + 9^2 = 130$ in memory B, 2 in memory N
[ENT] (READ) (PV)	130	Display contents of memory B
[COMP] ($\sqrt{\ }$)	11.40	$\sqrt{130}$

FINANCIAL OPERATIONS

The basic compound interest and annuity (loan amortization or sinking fund) formulae are programmed into the calculator. This feature makes possible rapid solution of problems involving lump sum or periodic-payments invested or borrowed at interest.

The problem variables are entered by depressing the [ENT] key followed by the key with the appropriate secondary function designator:

(n)	number of periods over which interest is compounded	(PMT)	payment per period (n)
(i)	interest rate per period	(PV)	present value
(i/yr)	annual interest when n is in months (= 12i)	(FV)	future value

These variables can be entered in any order. After the known variables have been entered, the answer is obtained by depressing the [COMP] key followed by the key with the secondary function designator for the unknown variable. This key sequence performs a calculation which depends on the variables entered.

Key Sequence	Explanation of Key
[COMP] (FV)	Compounded Lump Sum — If a PV entry has been more recently made than a PMT entry, the future value of a lump sum at compound interest is calculated according to the formula $FV = PV\ (1 + i)^n$ Sinking Fund — If a PMT entry has been more recently made than a PV entry, the future value of periodic payments made to a sinking fund is calculated according to the formula $FV = PMT\ \frac{(1 + i)^n - 1}{i}$
[COMP] (PV)	Discounted Lump Sum — If a FV entry has been more recently made than a PMT entry, the present value of a future lump sum discounted at interest is calculated according to the formula $PV = \frac{FV}{(1 + i)^n}$ Annuity — If a PMT entry has been more recently made than a FV entry, the present value (cost) of an annuity is calculated according to the formula $PV = PMT\ \frac{(1 + i)n - 1}{i\ (1 + i)^n}$

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Missing

Example 6b: Find the interest paid in the 12-month period after the 59th payment, and find the principal balance at the end of this period, i.e. after the 71st payment.

To solve this problem, first calculate the interest during the first 59 payments, then the interest during the subsequent 12 payments.

Key In	Display	Comment
7.5 [ENT] (i/yr)	7.5	See footnote
175 [ENT] (PMT)	175	See footnote
25000 [ENT] (PV)	25000	
59 [ENT] (n)	59	
[COMP] (i)	8992.19	Interest on first 59 payments
12 [ENT] (n)	12	
[COMP] (i)	1763.63	Interest on payments 60-71
[ENT] (READ) (PV)	23330.78	Balance after 71st payment

Footnote:
If you have not turned the calculator off or used the memories for other probelms, you need not re-enter the interest and payment.

Example 6c: The payment has been rounded to the nearest dollar. Consequently, the last payment must be adjusted to produce a zero loan balance. What is the last payment?

Key in	Display	Comment
7.5 [ENT] (i/yr)	7.5	See footnote
175 [ENT] (PMT)	175	See footnote
25000 [ENT] (PV)	25000	
[COMP] (n)	359	Number payments required NOTE: This calculation requires about 30 seconds.
[ENT] (READ) (PV)	89.72 minus	Overpayment in last payment
[+][ENT] (READ) (PMT)	175	
Algebraic [=], Business [+]	85.28	Amount of last (359th) payment

Footnote:
Assuming the i/yr and PMT memories have not been modified, there is need to re-enter interest rate and payment.

Example 7a: Find the future value.

$1,000 capital is to bear 6% interest compounded annually for 7 years.

Key in	Display	Comment
1000 [ENT] (PV)	1000	
6 [ENT] (i)	6	
7 [ENT] (n)	7	
[COMP]	7	Compute. Compute what?
(FV)	1503.63	(FV) future value, answer.

Example 7b: Suppose the same $1,000 capital is to bear 6% interest compounded monthly for 7 years. What is the final value?

Key in	Display	Comment
1000 [ENT] (PV)	1000	
6 [ENT] (i/yr)	6	6% per year divided into 12 months.
7 [x] 12 [=] [ENT] (n)	84	months.
[COMP] (FV)	1520.37	Future value, answer.

Above two samples show you the difference between (i/yr) and (i) and you must understand these clearly. If (i/yr) key is used, (n) must be in months, and NOT years!

Example 7c: Future Value of a Compounded Lump Sum

A savings certificate pays 7.5% annual interest when held for 4 years. What is the value of an account with an initial amount of $5000 at the end of a 4-year period if interest is compounded annually?

Key in	Display
7.5 [ENT] (i)	7.5
4 [ENT] (n)	4
5000 [ENT] (PV)	5000
[COMP] (FV)	6677.35

Example 8: Present Value of a Discounted Lump Sum

A 7.5% savings certificate is available which compounds interest monthly rather than annually. How much must be deposited to obtain $6677.35 after 4 years?

Key in	Display
6677.35 [ENT] (FV)*	6677.35
7.5 [ENT] (i/yr)	7.5
4	4
[x] 12	12
[=]	48
[ENT] (n)	48
[COMP] (PV)	4951.32

*If the calculator has not been turned off or the FV memory altered after solving Example 7, there is no need to re-enter 6677.35

MARGIN OPERATIONS

RETAILING

The relationship between cost, selling price and margin is calculated according to the formula:

$$\text{Margin} = \frac{\text{Sell} - \text{Cost}}{\text{Sell}} \times 100$$

Any of the three variables can be calculated by entering the two known variables in any order into the appropriate memory by depressing the [ENT] key followed by the key with the desired secondary function designator, then depressing the [COMP] key followed by the secondary function designator for the unknown variable.

Example 1: Margin Calculation — An item which sells for $11.95 costs the retialer $8.42. What is the margin?

Key in	Display	Comment
11.95 [ENT] (SELL)	11.95	
8.42 [ENT] (COST)	8.42	
[COMP] (MARGIN)	29.54	Answer in %

Example 2: Selling Price Calculation — A retailer requires a margin of 35%. What should his minimum selling price be for an item which costs him $45?

Key in	Display
35 [ENT] (MARGIN)	35
45 [ENT] (COST)	45
[COMP] (SELL)	69.23

Example 3: Cost Calculation — An item can be retailed for $15.45. What can he afford to pay for the item if a 40% margin is required?

Key in	Display
15.45 [ENT] (SELL)	15.45
40 [ENT] (MARGIN)	40
[COMP] (COST)	9.27

SECURITIES

The securities industry defines margin as the ratio of equity to collateral required to purchase or hold a security.

$$\text{Margin} = \frac{\text{Equity}}{\text{Collateral}} \times 100 = \frac{\text{Collateral} - \text{Debt}}{\text{Collateral}} \times 100$$

For purposes of margin calculation in the securities industry, collateral (stock value) is entered using the (SELL) key and debt is entered using the (COST) key.

Example 1: Loan Value — Federal Reserve Board initial margin requirements are 65%. You own securities with a market value of $8,000. How much can be borrowed using these securities for collateral?

Key in	Display
8000 [ENT] (SELL)	8000
65 [ENT] (MARGIN)	65
[COMP] (COST)	2800

Example 2: Margin Maintenance — The Federal Reserve Board margin maintenance requirement is 30%. Assume you have obtained the maximum loan against the securities in the prior example. To what market value can the securities decline before a margin call will be made?

Key in	Display
2800 [ENT] (COST)*	2800
30 [ENT] (MARGIN)	30
[COMP] (SELL)	4000

The debt of $2,800 need not be re-entered if the calculator has not been turned off and if no intervening calculations using B memory have been made.

Example 3: Securities Purchasing Power — If the proceeds of the loan ($2,800) in example 1 are used to purchase additional securities, what is the maximum market value of the additional securities? That is, how great a total debt can be incurred when all securities, the original $8000 worth plus the maximum amount purchased on margin, are pledged as collateral?

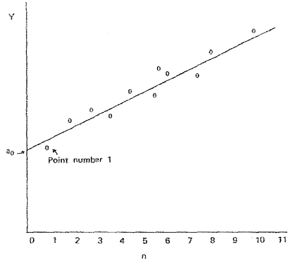
Key in	Display
2800	2800
[÷] 65	65
[%]	4307.69

TREND LINE COMPUTATIONS (LINEAR REGRESSION ANALYSIS)

A linear least square fit is used by the calculator to extrapolate a trend from available date. The extrapolation assumes (1) that the trend is linear (can be approximated by a straight line) and (2) that the straight line which provides the best extrapolation is the one which differs from the available data points in such a way that the sum of the squares of the difference from each of the data points is minimized.

The calculator has been programmed to define the line

$$y = a_0 + a_1 n$$



To clear the memories of prior data, the first data entry must be preceded by depression of the [COMP] (CA) keys in succession. Each data point entry is then followed by depression of the [ENT] (TL) keys. Following this key sequence, the number of the data point, n, entered is displayed. Upon completion of data entry, the trend line calculation is performed by the following key sequence:

[COMP] (TL) → a_0	(the intercept)

The following calculations can then be made:

[COMP] (TREND) → $Y_n + 1$	(extrapolated y for one point beyond the last datum entered)
n [ENT] (n) [COMP] (TREND) → Y_n	(extrapolated y for any point n)
[ENT] (READ) (TREND) → a_1	(the slope of the line)
[ENT] (READ) (TL) → a_0	(the intercept)

Note: All data points must be equally spaced and begin with point number one.

Example 1: Sales of an item, which is uninfluenced by seasonal variations, have been 119, 123, 122, 125, 130, 128, 132, 135 over the last eight months.

a. What are the projected sales for the ninth month?
b. What are the projected sales for the 18th month?
c. What is the projected monthly increase in sales (slope of the line)?

Key in	Display	Comment
[COMP] (CA)	0	Clears all memories
119	119	
[ENT] (TL)	1	
123	123	
[ENT] (TL)	2	
122	122	
[ENT] (TL)	3	
125	125	
[ENT] (TL)	4	
130	130	
[ENT] (TL)	5	
128	128	
[ENT] (TL)	6	
132	132	
[ENT] (TL)	7	
135	135	
[ENT] (TL)	8	
[COMP] (TL)	117.11	The intercept (expected sales in month 0)
[COMP] (TREND)	136.39	Projected sales for 9th month
18	18	
[ENT] (n)	18	
[COMP] (TREND)	155.68	Projected sales for 18th month
[ENT] (READ) (TREND)	2.14	Slope (projected monthly increase in sales)

AVERAGING (ARITHMETIC MEAN)

Use of the summation (Σ) key is described in the section on Memory Operations. Use of this key in conjunction with the ($\bar{x}$) key provides a convenient means of finding the average (arithmetic mean) of a series of entries. Clear all memories before beginning an averaging problem.

Example : You have purchased an equal number of shares of a stock at the following prices: 19¼, 23½, 21, 25¾. What is your average cost?

Key in	Display	Comment
[COMP] (CA)	0	Clears all memories
19.25	19.25	
[ENT] (Σ)	1	
23.5	23.5	
[ENT] (Σ)	2	
21	21	
[ENT] (Σ)	3	
25.75	25.75	
[ENT] (Σ)	4	
[COMP] ($\bar{x}$)	22.38	

PERCENTAGE CHANGE CALCULATIONS

The percentage change between any two numbers can be calculated according to the equation:

$$[\%]\ \text{Change} = \frac{\text{Current} - \text{Last}}{\text{Last}} \times 100$$

Example 1: You purchased a stock at 49 and sold it at 63. What is the percentage gain?

Key in	Display
49 [ENT] (% Δ)	49
63	63
[COMP] (% Δ)	28.57

Example 2: Percentage change calculations can be chained. In example 1, what is the percentage decline from the selling price if the stock subsequently goes to 52. Assume the memories have not been modified since completion of example 1.

Key in	Display
52	52
[COMP] (% Δ)	17.46 minus

APPENDIX A. RECOVERY TECHNIQUES

Occasionally you may unintentionally depress one of the function or control keys. The following techniques allow easy correction without loss of the displayed number.

Unintentional [COMP] or [ENT] :
Depress (DP), followed by the number of decimal places already displayed. None of the entries are altered.

Unintentional [×] or [÷] : Depress 1, then [=] . If constant multiplication or division is being performed, the constant is replaced by 1.

Unintentional [+] or [−] :
Algebraic logic: Depress 0, then [=] . If constant addition or subtraction is being performed, the constant is replaced by 0.

Business logic: If [+] was depressed unintentionally, depress [−] ;
If [−] was depressed unintentionally, depress [+] .

APPENDIX B. ERROR CONDITIONS

The operations described in this appendix result in an error condition. Until the error condition is cleared, all key sequences are inoperative except [C] or [COMP] (CA).

1. Division by Zero — The overflow symbol and 0.00 are normally displayed. If the decimal setting is other than 2, the number of zeros corresponding to the decimal setting appear to the right of the decimal.

2. Exceeding Display Capacity — Any arithmetic operation producing a result with a magnitude greater than 99999999 causes the overflow light to turn on and the 8 most significant digits of the result to be displayed with the decimal adjusted 8 places to the left of the correct position (wrap around decimal). A single depression of the [C] key allows continuation of the calculation with an error factor of 10^8 (i.e. the result must be multiplied by 100,000,000 to obtain the correct answer or move the decimal 8 places to the right).

   An attempt to enter a whole number or mixed number with more than 8 digits (e.g. 12.3456789) will result in only the first eight digits being displayed (e.g. 12.345678). An attempt to enter a decimal fraction (number with absolute value less than 1) with more than 7 digits will result in loss of leading zeros and the decimal point (the only situation where no decimal will be displayed). The display will show the number entered beginning with first non-zero digit (e.g. 0.01234567 will be displayed as 1234567). The number displayed will be positioned on the right side of the display. If more than 7 zeros are entered following the decimal point, the display will be blanked. Depression of any of the function or answer keys will locate the decimal point correctly, restore the leading zeros, round the displayed number to the number of decimal places selected (i.e., 1234567 becomes 0.01234567), and perform the previously established condition, if any. In general, if these conditions occur, it would be preferable to depress the [C] key and re-enter the number, restricting the entry to 7 digits.

3. Exceeding Capacity of Memories A, B or I – A calculation which result in an attempt to store a number greater than 99999999 in memories A, B or I causes the overflow light to turn on. A [C] key depression allows calculations to continue with the erroneous number (by a factor of 10^{-8}) stored in the overflowed memory. The results of such a calculation are likely to be in error, however, and the problem should be scaled down to avoid overflow.

Example 1: Find the mean and the sum of the squares of 9525, 6920, and 1016.

			Memory Contents		
Key in	Display	A	B	I	N
[COMP] (CA)	0	0	0	0	

Key			Memory Contents		
Key in	Display	A	B	I	N
[COMP] (CA)	0	0	0	0	0
9525	9525	0	0	0	0
[ENT] (Σ)	1	9525	90725625	0	1
6920	6920	9525	90725625	0	1
[ENT] (Σ)	2(Overflow)	16445	1.3861202	0	2

Note that memories A and N contain the correct values while memory B (which sums the squares of the entries) has overflowed and is in error by a factor of 10^{-8}. In this case, the mean could be calculated by clearing the overflow condition and continuing with the problem because only memories A and N are used.

			Memory Contents		
Key in	Display	A	B	I	N
C	2	16445	1.3861202	0	2
1016	1016	16445	1.3861202	0	2
[ENT] (Σ)	3	17461	1032257.3	0	3
[COMP] ($\bar{x}$)	5820.33	17461	1032257.3	0	3

Example 1: Corrected for Overflow: Although the mean (5820.33) has been calculated, the overflow condition has prevented calculation of the sum of the squares. To find the sum of the squares, the entries and answer must be scaled, e.g., enter 9,525, 6.92 and 1.016 and multiply the mean by 1000 and the sum of the squares by 1000^2.

Key in	Display	Memory Contents A	B	I	N
[COMP] (CA)	0	0	0	0	0
9.525	9.525	0	0	0	0
[ENT] (Σ)	1	9.525	90.725625	0	0
6.92	6.92	9.525	90.725625	0	1
[ENT] (Σ)	2	16.445	138.61202	0	2
1.016	1.016	16.445	138.61202	0	2
[ENT] (Σ)	3	17.461	139.64427	0	3
[COMP] (x)	5.82	17.461	139.64427	0	3

The correct $\bar{x}$ = 5.82 x 1000 = 5820

[ENT] (READ) (PV)	139.64	17.461	139.64427	0	3

The correct Σx^2 = 139.64 x 1 000 000 = 139 640 000

4. Invalid Enteries To Memory N: An attempt to store a number greater than 9999 or a decimal number (such as 1.25) in memory N through a keyboard entry does not give an error indication, but only up to 4 least significant digits are stored. Consequently, results of subsequent calculations will be in error.

   There is no possibility of a valid calculation for n which produces a value of n greater than memory N capacity. Any time PMT, PV and i values are entered such that $\frac{PMT}{PV} - \frac{i}{100} < 0.0000001$, the calculator display is blank until the calculator power switch is turned off and on again. This condition does not occur until n (the number of loan payments) exceeds 1116, so it is of no practical concern.

5. Invalid Loan Amortization Problem Entries:

   a) Attempt to calculate n with an inadequate payment to amortize the loan.
   The overflow indicator lights and the display shows the number of periods required to overflow memory B in which present value (PV) is stored.

   b) Attempt to calculate n with a zero payment.
   The display goes blank until the calculator power switch is turned off and on again.

   c) Attempt to calculate n with a negative payment.
   The display goes blank until the calculator power switch is turned off and on again.

APPENDIX C. EXTENDED APPLICATIONS

Other portions of this manual have illustrated the types of problems which can be solved by the calculator through its built-in programming. The potential applications, however, are much broader when suitable formulae are used. This appendix illustrates a few such extended capabilities, including the following:

1. Bond Value Calculations
2. Depreciation Calculations
3. Standard Deviation and Standard Error of the Mean Calculation.

BOND VALUE CALCULATION

Compound Discount Method

To determine the price of a bond providing a given yield to maturity, the face value and the interest payments must be discounted at the required yield to maturity and summed to determine the present worth.

Example 1: A bond which matures in 12 years has a 4½% coupon. What price will provide an 8% yield to maturity?

Key in	Display	Comment
4.5 [ENT] (PMT)	4.5	Annual coupon payment
12 [ENT] (n)	12	
8 [ENT] (i)	8	
[COMP] (PV)	33.91	Discounted value of coupon payments
[ENT] (PMT)	33.91	33.91 stored into memory A (Memory A will not be used for the discounted lump sum calculation)
100 [ENT] (FV)	100	Face value of bond entered into memory B
[COMP] (PV)	39.71	Discounted value of face amount
[+] [ENT] (READ) (PMT)	33.91	Discounted value of face amount
Algebraic [=] Business [+]	73.62	Bond price to yield 8%

Annuity Method

To determine the price of a bond providing a given yield to maturity by the annuity method, the difference between the coupon rate and yield to maturity must be discounted over the life of the bond and added to the face value.

Example 1: For the bond in the prior example, find the price by the annuity method.

Key in		Display	Comment
Business Logic	Algebraic Logic		
4.5 [+]	4.5	4.5	
8	[−] 8	8	
[−]	[=]	3.5 minus	
[ENT] (PMT)	[ENT] (PMT)	3.5 minus	
12 [ENT] (n)	12 [ENT] (n)	12	
8 [ENT] (i)	8 [ENT] (i)	8	
[COMP] (PV)	[COMP] (PV)	28.38 minus	Required bond discount
[+] 100	[+] 100	100	
[+]	[+]	73.62	Bond price to yield 8%

DEPRECIATION CALCULATIONS

Sum of Digits Depreciation Method

A commonly used technique for allocation of depreciation is the sum of the digits method. If *n* is the number of years over which depreciation is to be taken, and is the year for which depreciation is to be calculated, then:

$$\text{Depreciation} = \frac{2\ (n + 1 - i)\ (\text{Value})}{n(n + 1)}$$

The book value of the depreciated property can be calculated by:

$$\text{Book Value} = 1 - \frac{i\ (2n + 1 - i)}{n(n + 1)}\ (\text{Original Value})$$

Example 1: Depreciable property worth $30,000 is to be depreciated over 25 year by sum of digits (SOD) method. What are the first and tenth year depreciations?

Key in: Business Logic	Key in: Algebraic Logic	Display	Comment
25 [↑]	25	25	
1	[+] 1	1	
[+]	[=]	26	
[ENT] (PMT) [↑]	[ENT] (PMT)	26	(n + 1) stored into memory A
1	[−] 1	1	i
[−]	[×]	25	n + 1 − i
[×] 2	2	2	
[÷]	[÷]	50	2 (n + 1 − i)
25	25	25	n
[÷]	[÷]	2	2 (n + 1 − i)/n
[ENT] (READ) (PMT)	[ENT] (READ) (PMT)	26	Recalls (n + 1) from memory A
[×]	[×]	0.08	1st year depreciation factor to 2 places
[COMP] (DP) 8	[COMP] (DP) 8	0.0769231	1st year depreciation factor in floating format.
30000	30000	30000	Value
[=]	[=]	2307.6921	1st year depreciation
[ENT] (READ) (PMT) [↑]	[ENT] (READ) (PMT)	26	Recalls (n + 1) from memory A
10	[−] 10	10	i
[−]	[×]	16	n + 1 − i
[×] 2	2	2	
[÷]	[÷]	32	2 (n + 1 − i)
75	25	25	n
[÷]	[÷]	1.28	2 (n + 1 − i)/2
[ENT] (READ) (PMT)	[ENT] (READ) (PMT)	26	Recalls (n + 1) from memory A
[×]	[×]	0.0492308	10th year depreciation factor
30000	30000	30000	Value
[=]	[=]	1476.9228	10th year depreciation

Example 2: Find the book value after the 10th year for example 1.

Key in: Business Logic	Key in: Algebraic Logic	Display	Comment
2	2	2	
[x] 25	[x] 25	25	n
[=] [+]	[+]	50	2n
1	1	1	
[+]	[−]	51	2n + 1
10	10	10	i
[−]	[x]	41	2n + 1 − i
[x] 10		10	(Business logic only)
[÷]	[÷]	410	i (2n + 1 − i)
25	25	25	
[÷]	[÷]	16.4	i (2n + 1 − i)/n
26	26	26	n + 1
[=]	[=]	0.6307692	i (2n + 1 − i)/n (n + 1)
[−]	[ENT] (+/−) [+]	0.6307692 minus	
1	1	1	
[+]	[x]	0.3692308	Book value factor
[x] 30000	30000	30000	Original value
[=]	[=]	11076.924	Book value after 10th year

Declining Balance Depreciation Method

Depreciation by the declining balance method is a constant percentage of the remaining book value (tax basis). The percentage is equal to the declining factor divided by the depreciable life. The book value at any time is equal to the present value as determined by the discounted lump sum formula.

$$PV = \frac{FV}{(1 + i)^n}$$

Where FV = original book value
n = year for which book value is to be calculated
i = derpeciation percentage

Example 1: If the property in the examples under the SOD method is to be depreciated by 150% declining balance method, find the first and tenth year depreciation.

Key in	Display	Comment
150	150	
[÷] 25	25	
[=]	6	Depreciation percentage
[ENT] (i)	6	6% stored into memory i
[x] 30000	30000	
[%]	1800	1st year depreciation
9 [ENT] (n)	9	
30000 [ENT] (FV)	30000	
[COMP] (PV)	17756.95	Book value at end of 9th or beginning of 10th year
[x][ENT] (READ) (i)	6	Recall depreciation % from memory i
[%]	1065.42	10th year depreciation

Example 2: If an entire depreciation table is to be generated, the automatic discount approach is more convenient than example 1.

An automobile which costs $4,500 is to be depreciated by double (200%) declining balance over a five-year period. Determine the depreciation and book value for each year.

Key in: Business Logic	Key in: Algebraic Logic	Display	Comment
200 [÷]	200 [÷]	200	
5	5	5	
[=]	[=]	40	Depreciation percentage
[ENT] (i)	[ENT] (i)	40	40% stored into memory i
4500	4500	4500	
[x][ENT] (READ) (i)	[−][ENT] (READ) (i)	40	Depreciation percentage recalled
[%]	[%]	1800	1st year depreciation
[−]	[=]	2700	Book value after 1st year
[x][ENT] (READ) (i)	[−][ENT] (READ) (i)	40	
[%]	[%]	1080	2nd year depreciation
[−]	[=]	1620	Book value after 2nd year
[x][ENT] (READ) (i)	[−][ENT] (READ) (i)	40	
[%]	[%]	648	3rd year depreciation
[−]	[=]	972	Book value after 3rd year
[x][ENT] (READ) (i)	[−][ENT] (READ) (i)	40	
[%]	[%]	388.8	4th year depreciation
[−]	[=]	583.2	Book value after 4th year
[x][ENT] (READ) (i)	[−][ENT] (READ) (i)	40	
[%]	[%]	233.28	5th year depreciation
[−]	[=]	349.92	Residual book value

Standard Deviation and Standard Error of the Mean

Standard deviation (SD) and standard error (SE) of the mean can be calculated by:

$$SD = \frac{\sqrt{\Sigma x_i^2 - \frac{(\Sigma x_i)^2}{n}}}{n - 1} \qquad SE = \frac{SD}{\sqrt{n}}$$

The Σx_i^2 is stored in memory B, Σx_i in memory A and n (number of entries) in memory N when entries are made with the (Σ) key.

Example: Find the mean (refer to Averaging Section, page 31) and standard deviation and standard error of the mean of the following values of x: 10, 11, 3, 14, 18.

Key in: Business Logic	Key in: Algebraic Logic	Display	Comment
[COMP] (CA)	[COMP] (CA)	0	Clear all memories
10	10	10	
[ENT] (Σ)	[ENT] (Σ)	1	$n = 1$
11	11	11	
[ENT] (Σ)	[ENT] (Σ)	2	$n = 2$
3	3	3	
[ENT] (Σ)	[ENT] (Σ)	3	$n = 3$
14	14	14	
[ENT] (Σ)	[ENT] (Σ)	4	$n = 4$
18	18	18	
[ENT] (Σ)	[ENT] (Σ)	5	$n = 5$
[COMP] ($\bar{x}$)	[COMP] ($\bar{x}$)	11.2	Mean
[ENT] (READ) (PMT)	[ENT] (READ) (PMT)	56	Σx_i recalled from memory A
[x] [÷]	[x] [÷]	3136	$(\Sigma x_i)^2$
[ENT] (READ) (n)	[ENT] (READ) (n)	5	n recalled from Memory N
[=]	[÷]	627.2	$(\Sigma x_i)^{2/n}$
[−]	[ENT] (+/−)	minus 627.2	
[ENT] (READ) (PV)	[ENT] (READ) (PV)	7250	Σx_i^2 recalled from memory B
[+]	[=]	122.8	$\Sigma x_i^2 - (\Sigma x_i)^{2/n}$
[ENT] (i)	[ENT] (i)	122.8	122.8 stored into memory I
[C]		0	(Business logic only)
[ENT] (READ) (n) [+]	[ENT] (READ) (n)	5	n recalled from memory N
1	[−] 1	1	
[−]	[=]	4	$n - 1$
[÷] [=]	[÷] [=]	1	Sets up constant division (by 4)
[ENT] (READ) (i)	[ENT] (READ) (i)	122.8	$\Sigma x_i^2 - (\Sigma x_i)^{2/n}$ recalled from memory I
[=]	[=]	30.7	$\frac{\Sigma x_i^2 - (\Sigma x_i)^{2/n}}{n - 1}$
[COMP] ($\sqrt{\ }$)	[COMP] ($\sqrt{\ }$)	5.54	Standard deviation
[ENT] (i)	[ENT] (i)	5.54	SD stored into memory I
[ENT] (READ) (n)	[ENT] (READ) (n)	5	
[COMP] ($\sqrt{\ }$)	[COMP] ($\sqrt{\ }$)	2.24	$\sqrt{n}$
[÷] [=]	[÷] [=]	1	Sets up constant division (by 2.24)
[ENT] (READ) (i)	[ENT] (READ) (i)	5.54	SD recalled from memory I
[=]	[=]	2.48	Standard error of the mean