

Texas Instruments

electronic calculator
with memory

TI-2550-III

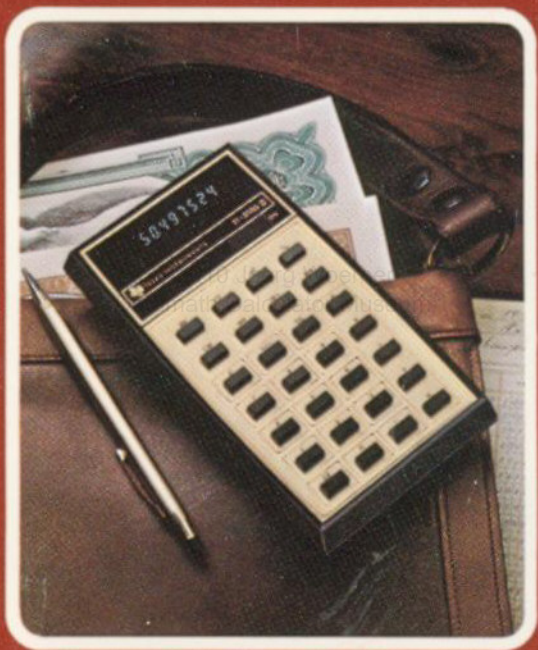


TABLE OF CONTENTS

	Page
INTRODUCTION	1
Features	1
OPERATING INSTRUCTIONS	3
Switches	3
Keys	3
Display	6
Battery Considerations	7
OPERATING EXAMPLES	9
Addition and Subtraction	9
Multiplication and Division	10
Error Correction	10
Multiplication and Division by a Constant	12
Addition and Subtraction of a Constant	12
Calculations With Positive and Negative Numbers	13
Performing Mixed Calculations	14
Using the Percent Key	14
Using the Memory	17
Complex Calculations	18
Reciprocals	20
Using the RV Key	21
Squares and Square Roots	22
Powers and Roots	23
APPENDICES	29
A. CONVERSION FACTORS	29
B. SERVICE INFORMATION	30
Battery Pack Replacement	30
In Case of Difficulty	31
Calculator Exchange Centers	33
If You Have Questions or Need Assistance	33

Toll-Free Telephone Assistance

For assistance with your TI-2550-III calculator, call one of the following toll-free numbers:

800-527-4980 (within all contiguous United States except Texas)

800-492-4298 (within Texas)

See Appendix B for further information on service.

NOTICE: A copy of the sales receipt or other proof-of-purchase date is required when the calculator is returned for in-warranty repair.

INTRODUCTION

The TI-2550-III Portable Memory Calculator has been designed and manufactured by Texas Instruments to provide you with a versatile computational tool to help solve mathematical problems in your home or business. The TI-2550-III may be operated as a portable calculator with the rechargeable battery pack or it may be operated on standard 115-volt household power with the AC Adapter/Charger. The following features highlight the operating capabilities of the TI-2550-III.

Features

Independent Memory – Calculation results or numbers can be summed to or subtracted from memory and recalled when needed. The memory can also be cleared without clearing the calculator.

Percent Key – Permits easy calculation of percentages, taxes, discounts and other similar problems.

Special Functions – Square, square root and reciprocal keys permit fast solutions to complex problems without affecting a calculation in progress.

Automatic Constant – Repetitive calculations with the same number are easily performed with the four arithmetic functions as the calculator automatically remembers the constant number.

Easy to Operate – Press the keys in the same order as the problem is written.

Fully Portable – Weighs less than 9 ounces and fits neatly in a briefcase or purse.

Long Life – Solid-state components, integrated circuitry and a vacuum fluorescent display provide dependable operation and long life.

Battery Pack – The TI-2550-III comes complete with a *fast-charge* rechargeable battery pack, model BP-3. Under normal use, the battery pack will provide 3 to 6 hours of operation without recharging. About 4 hours of recharging will restore full charge. Spare and replacement battery packs can be purchased directly from a Texas Instruments Consumer Service Facility as listed on the back cover.

AC Adapter/Charger – Battery pack recharge or direct operation from standard voltage outlets is easily accomplished with the AC Adapter/Charger model AC9130A included with the TI-2550-III. The TI-2550-III cannot be overcharged; it can be operated indefinitely with the adapter/charger connected. Please refer to the *Battery Considerations* portion of this manual.

© 2010 Joerg Woerner
Datamath Calculator Museum

OPERATING INSTRUCTIONS

Switches

On/Off Switch – Located on the right front surface of the calculator beneath the display. Sliding the switch to the right turns the calculator on and sliding it to the left turns the calculator off. The power-on condition is indicated by a number in the display.

Keys

[0] - [9] Keys – Enters numbers. A maximum of eight digits can be entered to the left of the decimal or a maximum of seven digits can be entered to the right of the decimal.

[.] Key – Enters a decimal point. The decimal point automatically appears to the right of an entered number unless positioned elsewhere with the [.] key.

The four arithmetic keys, [+], [−], [X], [÷], will each perform an equals operation and the calculator will display an intermediate result when used in a chain calculation. Therefore, a *displayed number* called out in the following key descriptions may be an intermediate result or a newly entered number. The *next entered quantity* represents the number displayed immediately before the next arithmetic or equals key is pressed. The *next entered quantity* can be a keyboard entry, a memory recall, or a result of a special function key.

[+] Key – Instructs the calculator to add the next entered quantity to the displayed number.

[−] Key – Instructs the calculator to subtract the next entered quantity from the displayed number.

[X] Key – Instructs the calculator to multiply the displayed number by the next entered quantity.

[÷] Key – Instructs the calculator to divide the displayed number by the next entered quantity.

[=] Key – Instructs the calculator to complete the previously entered arithmetic operation and to display the result.

IMPORTANT: Repeated pressing of [=] following an arithmetic calculation using [+], [−], [X], or [÷] is not ignored. The last arithmetic key entry and number entry are reused by the calculator to perform an automatic constant calculation.

[C] Key – Clears the calculator and sets the display to zero. This key does not clear the memory.

[CE] Key – Clears the last number entered on the keyboard. Used to change erroneous number entries without affecting previous arithmetic entries or intermediate results.

[+/-] Key – Changes the sign of the displayed number from positive to negative or vice versa. This key may be used immediately before or after a number entry. However, when used immediately after +, −, ×, ÷ or =, the minus sign displayed applies to the next entered number – not to the number or intermediate result displayed.

% Key – Converts a displayed percent value to the decimal equivalent by automatically moving the decimal point two places to the left. This key can be used with the arithmetic keys to calculate percentages, add-on or discount percentages, or the percentile of one number to another. See *Using the Percent Key* in this manual.

RV Key – Reverses the displayed number and the previously entered number or intermediate result each time it is pressed. Used to reverse the numerator and denominator in division or to recall a prior entry or result in addition and subtraction.

x^2 Key – Finds the square of the displayed number (that is, multiplies the number displayed by itself).

\sqrt{x} Key – Finds the square root of the displayed number (that is, finds the number which multiplied by itself, equals the number displayed).

$1/x$ Key – Finds the reciprocal of the displayed number (that is, divides the displayed number into 1).

M+ Key – Transfers or adds a displayed number to the electronic memory. Note the **M+** key adds the displayed number to any number previously stored in the memory rather than replacing the previous number.

M- Key – Subtracts the displayed number from the number stored in the memory.

MR Key – Recalls the number in memory to the display. The number shown on the display is also retained by the memory until the **CM** key is depressed.

CM Key – Clears the calculator memory.

Display

Power On Indication – The presence of digits in the display is indication that power is on.

Minus Sign – Appears at the left of the displayed number to indicate a negative number.

Decimal Point – Automatically appears to the right of any number entered unless positioned elsewhere by use of $\square \cdot \square$ key. A zero will precede the decimal for decimal numbers.

Decimal Alignment – In addition or subtraction problems the TI-2550-III will display in a result as many decimal places as are contained in the entry with the most decimal places. For example, the result of the problem $1.273 \square - \square .203$ is displayed as 1.070, instead of 1.07. This decimal alignment is maintained until the $\square \text{C}$ key is used to reset the decimal to the far right position or another problem with more decimal places is entered.

Memory In Use Indication – When a number (other than zero) is stored in the memory, the symbol ($\square \text{M}$) will appear at the left of the display. This symbol will be cleared if $\square \text{CM}$ is pressed or if the result in memory becomes zero through use of $\square \text{M+}$, or $\square \text{M-}$.

Overflow/Error Indication – An overflow/error symbol ($\square \text{E}$) will appear at the far left of the display for the following reasons:

1. The result of a calculation has more than eight digits to the left of the decimal. The display will show the eight most significant digits of the correct result and the decimal point will appear eight places to the left of its correct position. To determine the correct position of the decimal point, mentally move it eight places to the right, adding zeros as required. Press $\square \text{C}$ to clear calculation overflow.

2. The total in memory has more than eight digits to the left of the decimal. Press **[CM]** to clear a memory overflow; or, press **[MR]** to recall the number from memory (decimal is shifted eight places to the left) then press **[C]** to clear the calculator.
3. Dividing a number by zero. Press **[C]** to enter another problem.
4. Pressing **[\sqrt{x}]** when zero is displayed. Press **[C]** to enter another problem.
5. Pressing **[\sqrt{x}]** when a negative number is displayed. The square root of the number is displayed disregarding the minus sign. Press **[C]** to enter another problem.

Battery Considerations

Low Battery Indication – When the battery pack is nearly discharged, the display will appear dim and may flash or show erroneous symbols or numbers before fading away. At this time, the calculator should be connected to the AC9130A Adapter/Charger to recharge the battery pack.

WARNING: Avoid leaving the calculator on for several hours after the display appears dim or other symptoms of battery discharge appear, as the battery pack may be damaged by excessive discharge in such a way that it can no longer be recharged. If the battery pack cannot be fully recharged in the normal period of time, it may be able to be restored to useful operation through a prolonged period of charging (see Appendix B).

IMPORTANT: The calculator will not operate from the adapter/charger unless the battery pack is properly installed.

Calculator Operation – If, during portable operation, the display becomes dim, the calculator should be connected to the adapter/charger and allowed to charge for at least one minute with the switch in the OFF position. The calculator can be operated during the recharge period, following the initial one minute period, by moving the switch to the ON position.

Initial Turn-On – A rechargeable battery pack can lose its charge. Therefore, before initially operating the calculator (and after a prolonged period of nonuse), the calculator should be attached to the adapter/charger and the battery pack allowed to charge for one minute before setting the switch to ON. The calculator can then be operated while attached to the adapter/charger, if desired. Before portable operation, however, the battery pack should be fully charged.

Periodic Recharging – For maximum rechargeable battery life, it is recommended that the calculator be operated as a portable, recharging the battery pack when necessary. The nickel-cadmium battery pack can lose its storage capability if it is not allowed to occasionally discharge. Therefore, connection of the calculator to the adapter/charger for long periods of time is not recommended; although no damage should be done to the calculator if it is left connected for a short period of time beyond that required to fully recharge the battery pack.

Recharge Time – From a discharged condition, the BP-3 battery pack can be recharged in approximately 4 hours if the calculator is not operated during the recharge period. If the calculator is operated during recharging, the time needed for full recharge is approximately 10 hours.

OPERATING EXAMPLES

The following examples show how to operate the TI-2550-III and should be followed to become familiar with how the calculator works.

Before using the calculator, charge the battery pack for one minute. The calculator can be used while the battery pack is charging, but it is recommended that it be charged for 4 hours before portable operation.

Place ON-OFF switch in the ON position, press the \boxed{C} key, and a zero should appear in the display.

Addition and Subtraction

Example: $4.23 + 4 = 8.23$

Enter	Press	Display
4.23	$\boxed{+}$	4.23
4	$\boxed{=}$	8.23

Example: $6 - 1.854 = 4.146$

Enter	Press	Display
6	$\boxed{-}$	6.
1.854	$\boxed{=}$	4.146

Example: $12.321 - 7.921 + 1.6 = 6$

Enter	Press	Display
12.321	$\boxed{-}$	12.321
7.921	$\boxed{+}$	4.400
1.6	$\boxed{=}$	6.000

The zeros to the right of the decimal demonstrate the decimal-alignment feature of the TI-2550-III. The calculator will continue to display three decimal places in final results of succeeding addition and subtraction problems until \boxed{C} is pressed or an entry or intermediate result contains more than three decimal places.

Multiplication and Division

Example: $27.2 \times 18 = 489.6$

Enter	Press	Display
27.2	$\boxed{\times}$	27.2
18	$\boxed{=}$	489.6

Example: $12 \div 5.2 = 2.3076923$

Enter	Press	Display
12	$\boxed{\div}$	12.
5.2	$\boxed{=}$	2.3076923

Example: $(4 \times 7.3) \div 2 = 14.6$

Enter	Press	Display
4	$\boxed{\times}$	4.
7.3	$\boxed{\div}$	29.2
2	$\boxed{=}$	14.6

Error Correction

Occasionally, an erroneous numerical entry will be entered or an incorrect function key will be pressed. The error can be corrected without clearing the calculator and starting the problem over again.

If an error is made in a numerical entry, the error can be corrected by immediately pressing the \boxed{CE} key and entering the correct number.

Example: $5 + 3 = 8$

Enter	Press	Display	Remarks
5	$\boxed{+}$	5.	
4		4.	4 pressed incorrectly
	\boxed{CE}	0.	Clear entry
3	$\boxed{=}$	8.*	Enter correct number and complete calculation

In general, if an arithmetic function key other than the desired one is pressed, the error can be corrected by immediately pressing the correct function key.

However, if the error made is pressing either the $\boxed{\times}$ or $\boxed{\div}$ key instead of the $\boxed{-}$ key, the error must be corrected by immediately entering 1, then pressing the $\boxed{-}$ key, since the $\boxed{-}$ key assigns a negative sign to the second number in multiplication and division problems.

Example: $5 \times 3 = 15$

Enter	Press	Display	Remarks
5	$\boxed{+}$	5.	$\boxed{+}$ Pressed in error
	$\boxed{\times}$	5.	Correct key pressed
3	$\boxed{=}$	15.	

Example: $3 - 2 = 1$

Enter	Press	Display	Remarks
3	$\boxed{+}$	3.	$\boxed{-}$ Pressed in error,
1	$\boxed{-}$	3.	see Note
2	$\boxed{=}$	1.	

NOTE: Notice that a 1 must be entered before pressing $\boxed{-}$ if $\boxed{\times}$ or $\boxed{+}$ is pressed in error as described above.

*If zeros are displayed to the right of the decimal, the decimal alignment feature described on page 6 is operating. Press \boxed{C} before continuing.

Multiplication and Division by a Constant

The automatic constant feature of the TI-2550-III allows multiplication or division of a series of numbers by one number. A number entered before the \times key in multiplication and after the \div key in division becomes the constant. The constant is erased by pressing the C key.

Example: $4 \times 5 = 20$, $4 \times 6 = 24$, $4 \times 7 = 28$

Enter	Press	Display
4	\times	4.
5	$=$	20.
6	$=$	24.
7	$=$	28.

Example: $12 \div 2 = 6$, $20 \div 2 = 10$, $44 \div 2 = 22$

Enter	Press	Display
12	\div	12.
2	$=$	6.
20	$=$	10.
44	$=$	22.

Addition and Subtraction of a Constant

A number entered after the $+$ key becomes a constant add number and a number entered after the $-$ key becomes a constant subtract number.

Example: $5 + 3 = 8$, $9 + 3 = 12$, $91 + 3 = 94$

Enter	Press	Display
5	$+$	5.
3	$=$	8.
9	$=$	12.
91	$=$	94.

Example: $8 - 6 = 2$, $25 - 6 = 19$, $3 - 6 = -3$

Enter	Press	Display
8	$\boxed{-}$	8.
6	$\boxed{=}$	2.
25	$\boxed{=}$	19.
3	$\boxed{=}$	-3.

Calculations With Positive and Negative Numbers

When performing calculations with negative numbers, a minus may be assigned to a displayed number by pressing $\boxed{+/-}$ immediately before or after entering the number.

Example: $5 \times (-4) = -20$

Enter	Press	Display
5	$\boxed{\times}$ $\boxed{+/-}$	-5.
4	$\boxed{=}$	-20.
or		
5	$\boxed{\times}$	5.
4	$\boxed{+/-}$ $\boxed{=}$	-20.

Example: $\left(\frac{-125}{5} + 3\right) \times (-4) = 88$

Enter	Press	Display
125	$\boxed{+/-}$ $\boxed{\div}$	-125.
5	$\boxed{+}$	-25.
3	$\boxed{\times}$	-22.
4	$\boxed{+/-}$	-4.
	$\boxed{=}$	88.

Performing Mixed Calculations

The TI-2550-III can do mixed calculations. Just press the keys in the same order as the problem is written.

Example: $12 \times 13 \div 14 + 15 - 16 = 10.142857$

Enter	Press	Display
12	\times	12.
13	\div	156.
14	$+$	11.142857
15	$-$	26.142857
16	$=$	10.142857

Using the Percent Key

It's easy to find percentages with the percent key. The following examples show how.

Example: 6% of \$1,250.00 = \$75.00

Enter	Press	Display
1250	\times	1250.
6	$\%$	75.

Note that the correct answer appears after the $\%$ key is pressed. The equals key is not used to complete this problem since the automatic-constant feature would cause incorrect results.

Example: \$578.50 equals what percent of \$1500?

Enter	Press	Display
578.5	$\boxed{+}$	578.5
1500	$\boxed{\%}$	38.566666

Example: \$65.00 plus 5% tax

Enter	Press	Display	Remarks
65	$\boxed{+}$	65.	
5	$\boxed{\%}$	3.25	Amount of tax
	$\boxed{=}$	68.25	Total

Example: \$85.00 less 7% discount

Enter	Press	Display	Remarks
85	$\boxed{-}$	85.	
7	$\boxed{\%}$	-5.95	Amt. of discount
	$\boxed{=}$	79.05	Total

Example: \$125.00 less 15% discount plus 4% tax.

Enter	Press	Display	Remarks
125	$\boxed{-}$	125.	
15	$\boxed{\%}$	-18.75	Amt. of discount
	$\boxed{=}$ $\boxed{+}$	106.25	Discounted price
4	$\boxed{\%}$	4.25	Amount of tax
	$\boxed{=}$	110.5	Total

Example:	19.95	
	+ 12.95	
	<hr/>	
	32.90	
-10%	- 3.29	
	<hr/>	
	29.61	Subtotal
	+ 16.00	
	- 7.95	
	<hr/>	
	37.66	
-5%	- 1.883	
	<hr/>	
	35.777	Grand Total

Enter	Press	Display
19.95	<input type="button" value="+"/>	19.95
12.95	<input type="button" value="-"/>	32.90
10	<input type="button" value="%"/>	-3.29
	<input type="button" value="="/> <input type="button" value="+"/>	29.61
16	<input type="button" value="-"/>	45.61
7.95	<input type="button" value="-"/>	37.66
5	<input type="button" value="%"/>	-1.883
	<input type="button" value="="/>	35.777

Using the Memory

Storing and Recalling Numbers

Example: $2 \times 3 = 6$

Enter	Press	Display	Memory
	C CM	0.	0
2	X	2.	0
3	=	6.	0
	M+	┌ 6.	6
	C	┌ 0.	6
	MR	┌ 6.	6
	CM	6.	0
	M-	┌ 6.	-6
	MR	┌ -6.	-6
	C CM	0.	0

Example: $\frac{(2 \times 3) + (3 \times 5) + (6 \times 5)}{3} = 17$

Enter	Press	Display	Memory
	C CM	0.	0
2	X	2.	0
3	= M+	┌ 6.	6
3	X	┌ 3.	6
5	= M+	┌ 15.	21
6	X	┌ 6.	21
5	= M+	┌ 30.	51
	MR ÷	┌ 51.	51
3	=	┌ 17.	51

Group and Grand Totals

Calculate the amount to be added/subtracted in memory using the $\boxed{+}$, $\boxed{-}$, $\boxed{\times}$ or $\boxed{\div}$ keys and the $\boxed{=}$ key; then depress $\boxed{M+}$ to add to memory or $\boxed{M-}$ to subtract from memory.

Example:

$$\begin{array}{r} 5 \\ +6 \\ +7 \\ \hline 18 \end{array} \quad - \quad \begin{array}{r} 4 \\ +2 \\ +9 \\ \hline 15 \end{array} = 3$$

Enter	Press	Display	Memory
	\boxed{C} \boxed{CM}	0.	0
5	$\boxed{+}$	5.	0
6	$\boxed{+}$	11.	0
7	$\boxed{=}$	18.	0
	$\boxed{M+}$	┌ 18.	18
4	$\boxed{+}$	┌ 4.	18
2	$\boxed{+}$	┌ 6.	18
9	$\boxed{=}$	┌ 15.	18
	$\boxed{M-}$	┌ 15.	3
	\boxed{MR}	┌ 3.	3

Complex Calculations

Sum of Products

Example:

$$\begin{array}{r} 4 \times \$11.99 = \$47.96 \\ 6 \times 2.97 = 17.82 \\ 12 \times 0.98 = 11.76 \\ \hline \text{Total} = \$77.54 \end{array}$$

Enter	Press	Display	Memory
	C CM	0.	0
4	X	4.	0
11.99	= M+	┌ 47.96	47.96
6	X	┌ 6.	47.96
2.97	= M+	┌ 17.82	65.78
12	X	┌ 12.	65.78
.98	= M+	┌ 11.76	77.54
	MR	┌ 77.54	77.54

Sum of Quotients

Example: $\frac{\$1.98}{4} + \frac{\$2.27}{2} + \frac{\$4.98}{8} = \2.25

Enter	Press	Display	Memory
	C CM	0.	0
1.98	+	1.98	0
4	= M+	┌ 0.495	0.495
2.27	+	┌ 2.27	0.495
2	= M+	┌ 1.135	1.63
4.98	+	┌ 4.98	1.63
8	= M+	┌ 0.6225	2.2525
	MR	┌ 2.2525	2.2525

Product of Sums

Example: $(2 + 3) \times (4 + 5) = 45$

Enter	Press	Display	Memory
	\boxed{C} \boxed{CM}	0.	0
2	$\boxed{+}$	2.	0
3	$\boxed{=}$ $\boxed{M+}$	┌ 5.	5
4	$\boxed{+}$	┌ 4.	5
5	$\boxed{\times}$	┌ 9.	5
	\boxed{MR} $\boxed{=}$	┌ 45.	5
	\boxed{CM}	45.	0

Reciprocals

Example: $1/6 = 0.1666666$

Enter	Press	Display
6	$\boxed{1/x}$	0.1666666

Example: $1/(3.1 + 4.3) = 0.1351351$

Enter	Press	Display
3.1	$\boxed{+}$	3.1
4.3	$\boxed{=}$ $\boxed{1/x}$	0.1351351

Example: $\frac{1}{\frac{1}{3} + \frac{1}{4} + \frac{1}{5}} = 1.2765957$

Enter	Press	Display
3	$\boxed{1/x}$ $\boxed{+}$	0.3333333
4	$\boxed{1/x}$ $\boxed{+}$	0.5833333
5	$\boxed{1/x}$ $\boxed{=}$	0.7833333
	$\boxed{1/x}$	1.2765957

Using the \boxed{RV} Key

Division by a Sum

Example: $\frac{1500}{15 + 25 + 35} = 20$

Enter	Press	Display
15	$\boxed{+}$	15.
25	$\boxed{+}$	40.
35	$\boxed{+}$	75.
1500	\boxed{RV}	75.
	$\boxed{=}$	20.

Product/Quotient of Sums

Example: $\frac{(7 + 5) \times (6 + 4)}{(2 + 1)} = 40$

Enter	Press	Display	Memory
	\boxed{C} \boxed{CM}	0.	0
7	$\boxed{+}$	7.	0
5	$\boxed{=}$ $\boxed{M+}$	12.	12
6	$\boxed{+}$	6.	12
4	$\boxed{\times}$	10.	12
	\boxed{MR}	12.	12
	$\boxed{=}$ \boxed{CM} $\boxed{M+}$	120.	120
2	$\boxed{+}$	2.	120
1	$\boxed{\div}$ \boxed{MR}	120.	120
	\boxed{RV} $\boxed{=}$	40.	120

The reverse entry key is also useful when it is necessary to exchange the contents of the display with the memory.

Example: Exchange the number 120 stored in memory with the number 40 in the display.

Press	Display	Memory
(Result of previous entries)	40.	120.
RV MR CM RV M+ RV	120.	40.

The above exchange sequence should only be used when the displayed number is a final result obtained with the equals key.

Squares and Square Roots

Squares

Example: $(4.2)^2 = 17.64$

Enter	Press	Display
4.2	x²	17.64

Example: $\left(\frac{4 \times 3}{2}\right)^2 = 36$

Enter	Press	Display
4	X	4.
3	÷	12.
2	= x²	36.

Square Roots

Example: $\sqrt{37} = 6.0827625$

Enter	Press	Display
37	√x	6.0827625

Example: $\sqrt{\frac{5 \times 4}{2}} = 3.1622776$

Enter	Press	Display
5	$\boxed{\times}$	5.
4	$\boxed{+}$	20.
2	$\boxed{=}$ $\boxed{\sqrt{x}}$	3.1622776

Example: $\sqrt{3^2 + 4^2} = 5$

Enter	Press	Display
3	$\boxed{x^2}$ $\boxed{+}$	9.
4	$\boxed{x^2}$ $\boxed{=}$	25.
	$\boxed{\sqrt{x}}$	5.

Powers and Roots

Raising Numbers to a Power

Because the TI-2550-III has an $\boxed{x^2}$ key, you can easily calculate any power which is a multiple of two (fourth, eighth, sixteenth, etc. power).

To Calculate	Enter	Press
N^4	N	$\boxed{x^2}$ $\boxed{x^2}$
N^8	N	$\boxed{x^2}$ $\boxed{x^2}$ $\boxed{x^2}$
N^{16}	N	$\boxed{x^2}$ $\boxed{x^2}$ $\boxed{x^2}$ $\boxed{x^2}$

To calculate other integer powers, enter the number, press the $\boxed{\times}$ key, and then press the $\boxed{=}$ key one less time than the power.

Example: $5^6 = 15625$

Enter	Press	Display
5	$\boxed{\times}$ $\boxed{=}$ $\boxed{=}$ $\boxed{=}$ $\boxed{=}$ $\boxed{=}$	15625.

An alternate method is to use the $\boxed{x^2}$ key to obtain the nearest multiple of two power that is less than the power desired, then press the $\boxed{=}$ key as many times as necessary to make up the difference.

Example: $5^6 = 15625$

Enter	Press	Display	Remarks
5	$\boxed{\times}$ $\boxed{x^2}$ $\boxed{x^2}$	625.	5^4 displayed
	$\boxed{=}$ $\boxed{=}$	15625.	

Example: $2^{12} = 4096$

Enter	Press	Display	Remarks
2	$\boxed{\times}$ $\boxed{x^2}$ $\boxed{x^2}$ $\boxed{x^2}$	256.	2^8 displayed
	$\boxed{=}$ $\boxed{=}$ $\boxed{=}$ $\boxed{=}$	4096.	

To raise a number to a negative power, you can raise the number to the positive power and then invert.

Example: $4^{-3} = \frac{1}{4^3} = 0.015625$

Enter	Press	Display
4	$\boxed{\times}$ $\boxed{=}$ $\boxed{=}$ $\boxed{1/x}$	0.015625

Finding Roots of a Number

Similar to the square key, the square-root key may be used directly to solve roots which are a multiple of two.

To Calculate	Enter	Press
$\sqrt[4]{N}$	N	$\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$
$\sqrt[8]{N}$	N	$\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$
$\sqrt[16]{N}$	N	$\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$ $\boxed{\sqrt{x}}$

Finding a root which is not a multiple of two with your calculator requires repetitive use of a special key sequence. The key sequence is different for each root and becomes more complex as the root value increases. Solving the third (cube) root of numbers is a common requirement and is accomplished as follows:

1. Completely clear the calculator by pressing **C** **CM** .
2. Enter the number to which the cube root is desired and store it in memory by pressing **M+** .
3. Estimate the cube root of the number as close as you can and enter it into the display.
4. Repeat the key sequence **X** **MR** **=** **\sqrt{x}** **\sqrt{x}** until the number displayed at the end of a sequence is exactly the same as the number displayed at the end of the previous sequence.
5. Root calculations performed as indicated in steps 1 through 4 will provide roots accurate to seven significant digits. You may cube the result at the end of any key sequence by pressing **X** **=** **=** to check accuracy and restore the last root value solved to the display by pressing **1** **=** .

© 2016 Joerg Woerner
Datamath Calculator Museum

Example: $\sqrt[3]{75} = 4.2172633$

Enter	Press	Display	Remarks
	C CM	0.	
75	M+	75.	
4	X = =	64.	See note 1.
4	X MR = √x √x	4.1617914	1st Trial
	X MR = √x √x	4.2032515	2nd Trial
	X MR = √x √x	4.2136809	3rd Trial
	X MR = √x √x	4.2162923	4th Trial
	X MR = √x √x	4.2169454	5th Trial
	X MR = √x √x	4.2171087	6th Trial
	X MR = √x √x	4.2171496	7th Trial
	X MR = √x √x	4.2171598	8th Trial
	X MR = √x √x	4.2171623	9th Trial
	X MR = √x √x	4.217163	10th Trial
	X MR = √x √x	4.2171631	11th Trial
	X MR = √x √x	4.2171631	See note 2.
	X = =	74.999985	Check accuracy
1	=	4.2171631	Restore root value.

Note 1: The key sequence **X** **=** **=** cubes the estimated cube root of 75 to show that it is a reasonable estimate; $4^3 = 64$.

Note 2: Notice the result in the 12th trial is the same as the 11th trial which indicates the final result (root) has been obtained.

The solution to the cube-root example is accurate to seven significant digits as shown. However, if only four digits of accuracy are required, the solution could have been stopped with the 6th or 7th trial.

Do not be overly concerned about estimating the root value. Almost any number could be used for the estimate, though fewer trials are required when the estimate is close to the actual root.

Another method for finding roots, which is more versatile but less accurate, is an approximation technique related to logarithms. If you repeatedly take the square root of any number, the value will approach unity with a remainder that is proportional to the logarithm of the original number. By dividing the remainder value by the root value desired and reversing the sequence with the square key, a $\sqrt[y]{x}$ problem may be solved to within 0.05% when the values of x and y are both between 1 and 10 or 10 and 100. Other values may be used if less accuracy is tolerable. A unique feature of this method is that the root value is not restricted to an integer value. The optimum number of times to press \sqrt{x} is eleven, as shown in the following examples. Note that only positive values of x and y are valid and y must be greater than 1.

Example: $\sqrt[5.5]{8} = 1.4594801$

Enter	Press	Display
8	\sqrt{x} (11 times)	1.0010158
	$\frac{1}{x}$	1.0010158
1	$\frac{1}{x}$	0.0010158
5.5	$\frac{1}{x}$	0.0001846
1	$\frac{1}{x}$	1.0001846
	x^2 (11 times)	1.4592806

The calculated result is within 0.014% of the correct result 1.4594801.

Example: $\sqrt[23]{65} = 1.199008$

Enter	Press	Display
65	\sqrt{x} (11 times)	1.0020403
	-	1.0020403
1	\div	0.0020403
23	+	0.0000887
1	=	1.0000887
	x^2 (11 times)	1.19915

The calculated result is within 0.012% of the correct result 1.199008.

A y^x problem may be solved using a similar method if the remainder value is multiplied by the power (x). However, the accuracy is less than that for roots.

Example: $6^{3.2} = 309.08932$

Enter	Press	Display
6	\sqrt{x} (11 times)	1.0008752
	-	1.0008752
1	\times	0.0008752
3.2	+	0.0028006
1	=	1.0028006
	x^2 (11 times)	307.20698

The calculated result is within 0.61% of the correct result 309.08932.

APPENDIX A

CONVERSION FACTORS

English to Metric Conversions

To Find	Multiply	By
microns	mils	25.4
centimeters	inches	2.54
meters	feet	0.3048
meters	yards	0.9144
kilometers	miles (stat)	1.609344
grams	ounces (av)	28.3495231
kilograms	pounds (av)	0.45359237
liters	gallons (U.S.)	3.78541178
milliliters (cc)	fl. oz. (U.S.)	29.5735296
sq. centimeters	sq. inches	6.4516
sq. meters	sq. feet	0.09290304
sq. meters	sq. yards	0.83612736
milliliters (cc)	cu. inches	16.387064
cu. meters	cu. feet	0.028316847
cu. meters	cu. yards	0.764554858

Boldface numbers are exact; others are given to nine significant figures.

Temperature Conversions

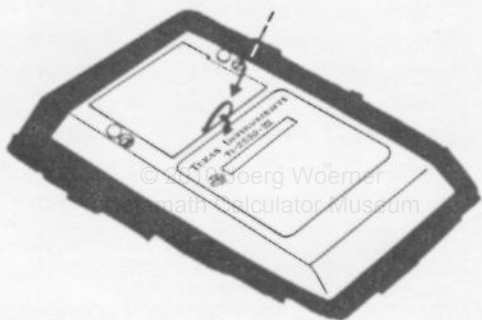
$$^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C}) + 32 = ^{\circ}\text{C} \times 1.8 + 32$$

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32) = \frac{^{\circ}\text{F} - 32}{1.8}$$

APPENDIX B SERVICE INFORMATION

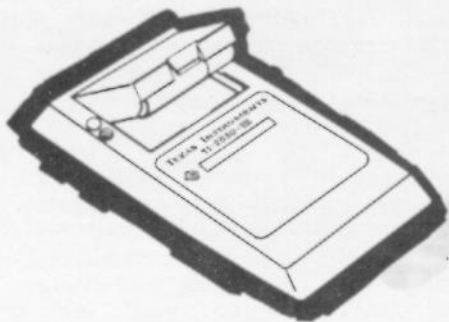
Battery Pack Replacement

The BP-3 battery pack can be very easily removed from the calculator. Hold the calculator with the keys facing down. Place a small coin (penny, dime) in the slot in the bottom of the calculator. A slight prying motion with the coin will pop the slotted end of the pack out of the calculator. The pack can then be removed entirely from the calculator.



The exposed metal contacts on the battery pack are the battery terminals. Care should always be taken to prevent any metal object from coming into contact with the terminals thereby shorting the battery pack.

To reinsert the battery pack, place the rounded part of the pack into the pack opening so that the small step on the end of the pack fits under the edge of the calculator bottom. The slotted end of the pack will then be next to the instruction label. A small amount of pressure on the battery pack will snap it properly into position.



Spare and replacement battery packs can be purchased directly from a Texas Instruments Service Facility as listed on the back cover.

In Case of Difficulty

1. Check to be sure the power switch is in the ON position. If no digits appear in the display, press the **C** key. If a number is displayed, but key entries or **C** key do not affect the display, switch the calculator OFF and ON.
2. If no display appears or if the display appears dim, place the calculator on charge, making sure the charger is plugged into a working 115 Vac/60 Hz outlet. Before operating your calculator while charging, switch the calculator to OFF and charge for one minute. For maximum portable use, allow the calculator to charge fully (four hours when off; ten hours when on) before using without the adapter/charger.

CAUTION: Use of other than the AC Adapter/Charger AC9130A may apply improper voltage to your calculator and will cause damage.

3. If the calculator has been left on for several hours after Low Battery Indication (Example: accidentally left on overnight), charge the calculator with the power switch OFF for 16 hours before portable use. Or, charge for one hour with the power switch OFF before using calculator with the adapter/charger connected.
4. Review the operating instruction to be certain calculations have been performed in the manner described in this book. Improper key sequences may result in incorrect calculations.

If none of the above procedures corrects the difficulty, return the calculator and charger PREPAID and INSURED to the applicable SERVICE FACILITY listed on the back cover.

NOTE: The P.O. box number listed for the Lubbock Service Facility is for United States parcel post shipments only. If you desire to use another carrier, please call the Consumer Relations Department for the proper shipping address.

For your protection, the calculator must be sent insured; Texas Instruments cannot assume any responsibility for loss of or damage to uninsured shipments. **A copy of the sales receipt or other proof of purchase date MUST be enclosed with the calculator to establish the warranty status of the unit** (please do not send the original document). If proof of purchase date is not enclosed, service rates in effect at time of return will be charged. Please include information on the difficulty experienced with the calculator, as well as return address information including name, address, city, state and zip code. The shipment should be carefully packaged and adequately protected against shock and rough handling.

Calculator Exchange Centers

If your calculator requires service, instead of returning the unit to a service facility for repair, you may elect to exchange the calculator for a factory-rebuilt calculator of the SAME MODEL at one of the exchange centers which have been established across the United States. Please call the Consumer Relations Department for further details and the location of the nearest exchange center.

If You Have Questions or Need Assistance

If you have questions or need assistance with your calculator, write the Consumer Relations at:

Texas Instruments Incorporated
P.O. Box 22283
Dallas, Texas 75222

or call Consumer Relations at 800-527-4980 (toll-free within all contiguous United States except Texas) or 800-492-4298 (toll-free within Texas). If outside contiguous United States call 214-238-5461. (We regret that we cannot accept collect calls at this number.)

For repair related inquiries only, you may also call our Service Facility toll-free at 800-858-1802 (800-692-1353 within Texas).

IMPORTANT: In addition to retaining your sales receipt or other proof of purchase date documentation, please record the following information. Any correspondence concerning the calculator must mention the model, serial number, and date of purchase.

TI-2550-III

Model No.	Serial No.	Purchase Date
------------------	-------------------	----------------------

IMPORTANT

THE WARRANTY IS VOID IF THE SERIAL NUMBER HAS BEEN ALTERED OR DEFACED.

Texas Instruments reserves the right to make changes in materials and specifications without notice.

ONE-YEAR LIMITED WARRANTY

This electronic calculator from Texas Instruments is warranted to the original purchaser for a period of one (1) year from the original purchase date — under normal use and service — against defective materials or workmanship. **ANY IMPLIED WARRANTIES ARE ALSO LIMITED IN DURATION TO THE ONE-YEAR PERIOD FROM THE ORIGINAL PURCHASE DATE.**

This warranty is void if: (1) the calculator has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in material or workmanship, (2) the serial number has been altered or defaced.

TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR LOSS OF USE OF THE CALCULATOR OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES OR DAMAGES INCURRED BY THE PURCHASER.

During the warranty period your calculator will either be repaired or it will be replaced with a reconditioned model of equivalent quality (at manufacturer's option) without charge to the purchaser, when returned prepaid and insured, with proof of purchase date, to a Texas Instruments service facility listed below. In the event of replacement with a reconditioned model, the replacement unit will continue the warranty of the original calculator or 90 days, whichever is longer. **UNITS RETURNED WITHOUT PROOF OF PURCHASE DATE WILL BE REPAIRED AT THE SERVICE RATES IN EFFECT AT THE TIME OF RETURN.**

IMPORTANT: Before returning your calculator for repair, carefully review service and mailing instructions in this manual.

Texas Instruments Consumer Service Facilities

Texas Instruments Service Facility
P.O. Box 2500
Lubbock, Texas 79408

Texas Instruments Service Facility
41 Shelley Road
Richmond Hill, Ontario, Canada

Consumers in California and Oregon may contact the following Texas Instruments offices for additional assistance or information:

Texas Instruments Consumer Service
78 Town and Country
Orange, California 92668
(714) 547-2556

Texas Instruments Consumer Service
10700 Southwest Beaverton Highway
Park Plaza West, Suite 111
Beaverton, Oregon 97005
(503) 643-6758

TEXAS INSTRUMENTS
INCORPORATED
DALLAS, TEXAS