

TOOR ELECTRONIC

Scientific Calculator



**TR-511
User's Manual**

Safety Precautions

Be sure to read the following safety precautions before using this calculator. Keep this manual handy for later reference.

Caution

This symbol is used to indicate information that can result in personal injury or material damage if ignored.

Batteries

- After removing the battery from the calculator, put it in a safe place where it will not get into the hands of small children and accidentally swallowed.
- Keep batteries out of the reach of small children. If accidentally swallowed, consult with a physician immediately.
- Never charge batteries, try to take batteries apart, or allow batteries to become shorted. Never expose batteries to direct heat or dispose of them by incineration.
- Misuse of batteries can cause them to leak and damage nearby items, and can create the risk of fire and personal injury.
- Always make sure that the battery's positive (+) and negative (-) ends are facing correctly when you load it into the calculator.
- Remove the battery if you do not plan to use the calculator for a long time

- Use only the type of battery specified for this calculator in this manual.

Disposing of the Calculator

- Never dispose of the calculator by burning it. Doing so can cause certain components to suddenly burst, creating the risk of fire and personal injury.
- The displays and illustrations (such as key markings) shown in this User's Guide are for illustrative purposes only, and may differ somewhat from the actual items they represent.

E-1

- The contents of this manual are subject to change without notice.

Handling Precautions

- **Be sure to press the (ON) key before using the calculator for the first time.**
- **Even if the calculator is operating normally, replace the battery at least once every three years for the.**

A dead battery can leak, causing damage to and malfunction of the calculator. Never leave a dead battery in the calculator.

- **The battery that comes with this unit discharges slightly during shipment and storage. Because of this, it may require replacement sooner than the normal expected battery life.**
- **Low battery power can cause memory contents to become corrupted or lost completely. Always keep written records of all important data.**

- **Avoid use and storage in areas subjected to temperature extremes.**

Very low temperatures can cause slow display response, total failure of the display, and shortening of battery life. Also avoid leaving the calculator in direct sunlight, near a window, near a heater or anywhere else it might be exposed to very high temperatures. Heat can cause discoloration or deformation of the calculator's case, and damage to internal circuitry.

- **Avoid use and storage in areas subjected to large amounts of humidity and dust.**

Take care never to leave the calculator where it might be splashed by water or exposed to large amounts of humidity or dust. Such conditions can damage internal circuitry.

- **Never drop the calculator or otherwise subject it to strong impact.**
- **Never twist or bend the calculator.**
Avoid carrying the calculator in the pocket of your trousers or other tight-fitting clothing where it might be subjected to twisting or bending.
- **Never try to take the calculator apart.**

E-2

- **Never press the keys of the calculator with a ball-point pen or other pointed object.**

- **Use a soft, dry cloth to clean the exterior of the calculator.**

If the calculator becomes very dirty, wipe it off with a cloth moistened in a weak solution of water and a mild neutral household detergent. Wring out all excess moisture before wiping the calculator. Never use thinner, benzene or other volatile agents to clean the calculator. Doing so can remove printed markings and can damage the case.

E-3

Contents

Safety Precautions	1
Handling Precautions	2
Two-line Display	6
Before getting started...	6
■ Modes	6
■ Input Capacity	7
■ Making Corrections During Input	7
■ Replay Function	8
■ Error Locator	8
■ Multi-statements	8
■ Exponential Display Formats	9
■ Decimal Point and Separator Symbols	9
■ Initializing the Calculator	10
Basic Calculations	10
■ Arithmetic Calculations	10
■ Fraction Operations	10
■ Percentage Calculations	12
■ Degrees, Minutes, Seconds Calculations	13
■ FIX, SCI, RND	14
Memory Calculations	15
■ Answer Memory	15
■ Consecutive Calculations	15
■ Independent Memory	15
■ Variables	16
Scientific Function Calculations	16
■ Trigonometric/Inverse Trigonometric Functions ...	17
■ Hyperbolic/Inverse Hyperbolic Functions	17

E-4

■ Common and Natural Logarithms/ Antilogarithms	18
■ Square Roots, Cube Roots, Roots, Squares, Cubes, Reciprocals, Factorials, Random Numbers, π, and Permutation/Combination	18
■ Angle Unit Conversion	19
■ Coordinate Conversion (Pol (x, y), Rec (r, θ))	19
■ Engineering Notation Calculations	20
Statistical Calculations	20
Standard Deviation	20
Regression Calculations	23
Technical Information	27
■ When you have a problem.....	27
■ Error Messages	27
■ Order of Operations	29
■ Stacks	30
■ Input Ranges	31
Power Supply	33

E-5

Two-line Display



The two-line display makes it possible to view both the calculation formula and its result at the same time.

- The upper line shows the calculation formula.
- The lower line shows the result.

A separator symbol is displayed every three digits when the integer part of the mantissa has more than three digits.

Before getting started...

■ Modes

Before starting a calculation, you must first enter the correct mode as indicated in the table below.

To perform this type of calculation:	Perform this key operation:	To enter this mode:
Basic arithmetic calculations	(MODE) (1)	COMP
Standard deviation	(MODE) (2)	SD
Regression calculations	(MODE) (3)	REG

- Pressing the (MODE) key more than once displays additional setup screens. Setup screens are described in the sections of this manual where they are actually used to change the calculator setup.
- In this manual, the name of the mode you need to enter in order to perform the calculations being described is indicated in the main title of each section.

Example: Statistical Calculations

E-6

Note!

- To return the calculation mode and setup to the initial defaults shown below, press (SHIFT) (CLR) (2) (Mode) (F).

Calculation Mode: COMP
Angle Unit: Deg
Exponential Display Format: Norm 1
Fraction Display Format: a/b
Decimal Point Character: Dot

- Mode indicators appear in the upper part of the display.
- Be sure to check the current calculation mode (SD, REG, COMP) and angle unit setting (Deg, Rad, Gra) before beginning a calculation.

■ Input Capacity

- The memory area used for calculation input can hold 79 "steps." One step is taken up each time you press a number key or arithmetic operator key (+, -, ×, ÷). A (SHIFT) or (ALPHA) key operation does not take up a step, so inputting (SHIFT) (√), for example, takes up only one step.
- You can input up to 79 steps for a single calculation. Whenever you input the 73rd step of any calculation, the cursor changes from "—" to "■" to let you know memory is running low. If you need to input more than 79 steps, you should divide your calculation into two or more parts.
- Pressing the (ANS) key recalls the last result obtained, which you can use in a subsequent calculation. See "Answer Memory" for more information about using the (ANS) key.

■ Making Corrections During Input

- Use (←) and (→) to move the cursor to the location you want.
- Press (DEL) to delete the number or function at the current cursor position.
- Press (SHIFT) (INS) to change to an insert cursor [I]. Inputting something while the insert cursor is on the display inserts the input at the insert cursor position.
- Pressing (SHIFT) (MS), or (F) returns to the normal cursor from the insert cursor.

E-7

■ Replay Function

- Every time you perform a calculation, the replay function stores the calculation formula and its result in replay memory. Pressing the (F) key displays the formula and result of the calculation you last performed. Pressing (F) again back steps sequentially (new-to-old) through past calculations.
- Pressing the (←) or (→) key while a replay memory calculation is on the display changes to the editing screen.
- Pressing the (←) or (→) key immediately after you finish a calculation displays the editing screen for that calculation.
- Pressing (AC) does not clear replay memory, so you can recall the last calculation even after you press (AC).
- Replay memory capacity is 128 bytes for storage of both expressions and results.
- Replay memory is cleared by any of the following actions.
When you press the (ON) key
When you initialize modes and settings by pressing (SHIFT) (CLR) (2) (or (3)) (F)
When you change from one calculation mode to another
When you turn off the calculator.

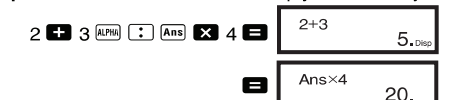
■ Error Locator

- Pressing (→) or (←) after an error occurs displays the calculation with the cursor positioned at the location where the error occurred.

■ Multi-statements

A multi-statement is an expression that is made up of two or more smaller expressions, which are joined using a colon (:).

- **Example:** To add 2 + 3 and then multiply the result by 4



E-8