

TI-10

Calculator and Arithmetic Trainer

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General Information

The TI-10 has two power sources — battery and solar. It operates in well-lit areas using the solar cell, and it operates in other light settings using the battery.

Examples: See the “Examples” page for problems with keystroke sequences that demonstrate many of TI-10 functions and capabilities. Before starting each problem set, reset and clear the TI-10 by pressing AC Clear . This helps to ensure that your displays are the same as those shown in the examples. In Problem Solving **AUTO** mode, however, displays will vary from those shown in the examples because the problems presented by the TI-10 are random.

On/Off

To turn the TI-10 on, press On/Off .

If the TI-10 is on, press On/Off to turn it off.

If you do not press any keys for about five minutes, the Automatic Power Down™ (APD™) feature turns off the TI-10 automatically. After APD, press On/Off to power up again. The display, all pending operations, settings, and memory (including history) are retained.

Two-Line Display and Scrolling

The TI-10 has a two-line display that shows up to 11 characters at a time on each line. Entries that do not fit on the first line wrap to the second. When the second line is filled, the characters scroll up.

Entries can be up to 88 characters. *Exceptions:* For **Op1** (Stored Operation), the limit is 44 characters. For Mode (Problem Solving) **MAN** (manual) mode, entries do not wrap; entries cannot exceed 11 characters.

When a result exceeds the capacity of the display, it is shown in scientific notation. However, if the result is greater than 10^{99} , an **OVERFLOW ERROR** is displayed; if the result is less than 10^{-99} , an **UNDERFLOW ERROR** is displayed.

Scroll using these keys: \rightarrow , \leftarrow , \uparrow , and \downarrow .

- Press \rightarrow and \leftarrow to scroll through entries or to move the underline from one item to another within a menu.
- Press \uparrow and \downarrow to scroll through history or to move between menus when the menus are displayed.

Clearing, Correcting, and Resetting

\leftarrow	Deletes the character to the left of the cursor.
Clear	Only clears the display and error condition. Does not clear value from memory, mode settings, etc.
MR/MC MR/MC	Clears the value from memory.
AC	Resets the TI-10 clearing the calculator completely and restoring all default settings. MEM CLEARED is displayed. Press Clear to clear the display. You can also reset by: <ul style="list-style-type: none"> • Using the RESET menu. See Calculator/Problem Solving menus. • Pressing On/Off and Clear simultaneously.

Display Indicators

Indicator	Definition
Mode	TI-10 is in the Problem Solving tool.
MAN	TI-10 is in the Place Value feature.
Fix	TI-10 is rounding results.
M	A value other than zero is in memory.
Op1	Stored operation is active.
Auto	Problem Solving (Mode) is in AUTO (automatic) mode.
$\cdot \div$	When using Fix , result will be displayed in decimal format.
$\uparrow \downarrow$	More entry history or menus are available. Press \uparrow (up) or \downarrow (down) to access.
$\leftarrow \rightarrow$	An entry extends beyond the capacity of the display. Press \leftarrow or \rightarrow to scroll.

Calculator / Problem Solving Menus

Press	Calculator Tool
Mode	QR . (Division result format)
Mode \uparrow	+1 ? (Show or hide OP)
Mode \uparrow \uparrow	Y n (Clear stored operation)
Mode \uparrow \uparrow \uparrow	n Y (Reject or select RESET)
Press	Problem Solving Tool (AUTO)
Mode	AUTO MAN (Automatic or Manual)
Mode \uparrow	1 2 3 (Level of Difficulty)
Mode \uparrow \uparrow	\pm - \times \div ? (Type of Operation)
Press	Problem Solving Tool (MAN)
Mode \rightarrow Enter	AUTO MAN (Automatic or Manual)
Mode \rightarrow Enter \uparrow	11 -. - 1 -. (Place Value feature)

Once in a menu:

- To underline a menu item, press \leftarrow or \rightarrow .
- To select the underlined item, press Enter .
- To exit a menu, press Mode .

Note: To select an option from the Place Value menu, the TI-10 must be in Mode (Problem Solving) **MAN** (manual) mode.

Pressing Mode while in the Mode (Problem Solving) tool temporarily displays the Scoreboard before the **AUTO / MAN** menu is displayed.

Order of Operations

The TI-10 uses the Equation Operating System (EOS™) to evaluate expressions.

1st	Expressions inside parentheses.
2nd	Functions that require a closing parenthesis) and precede the argument.
3rd	Negation (-).
4th	Multiplication, implied multiplication, division.
5th	Addition and subtraction.
6th	= completes all operations.

Basic Arithmetic

0 , 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9	Enters the numerals 0 through 9.
+ , - , x , \div	Adds, subtracts, multiplies, divides.
\cdot	Inserts a decimal point.
-	Enters a negative sign. (Does not act as an operator.)
(,)	Opens, closes a parenthetical expression.
=	Completes all operations.



Division

When you divide a positive whole number by a positive whole number using \div , the result is displayed in the form **Q r R**, where **Q** is the quotient and **R** is the remainder. For example, if you are in the **QR** setting: $12 \div 5 = 2 \text{ r } 2$.

If you use the result of **QR** division in a subsequent calculation, the TI-10 uses only the quotient. The remainder is dropped.

For decimal results, select the decimal division setting by pressing $\text{Mode} \rightarrow \text{Enter}$. Press $\text{Mode} \text{ Enter}$ to see the previous answer as a decimal. For example: $12 \div 5 = 2.4$.

Memory

After a calculation, press $\text{M}+$ to add the displayed result to the value in memory or $\text{M}-$ to subtract the displayed result from the value in memory. Whenever memory contains a value other than 0, **M** displays on the screen.

To recall the value from memory for use in a calculation, press MR/MC once.

To clear memory, press MR/MC twice.

Stored Operation

Op1 stores an operation with a constant value. You can then repeat this stored operation as many times as desired by pressing a single key — Op1 .

1. Press Op1 .
2. Enter the operator first (+, -, ×, ÷) and then the number.
3. Press Op1 .
4. Initialize with a starting value.
5. Each time you press Op1 , the operation with the constant is applied.

The computation with the stored operation appears in the first line of the display, and the result appears in the second line.

To hide the computation line:

1. Press $\text{Mode} \leftarrow \rightarrow$ (to underline ?, if necessary) Enter .
2. Press Mode again to return to the stored operation.
3. Continue pressing Op1 .

If the expression does not fit on the line, it will not show. When display space permits, a counter on the second line shows how many times you have pressed Op1 .

To clear the contents of **Op1**:

1. Press $\text{Mode} \leftarrow \leftarrow$.
2. Select **Y** (yes), if necessary.
3. Press Enter .
4. Press Clear or Mode to return to the last result display. Resetting the TI-10 also clears **Op1**.

Rounding

You can round results using Fix in conjunction with the Place Value keys to specify a given number of places. The internally stored value is not rounded. The calculated value is padded with zeros as needed. You must press Fix each time you want to change the number of places.

Keys	Action
$\text{Fix} \text{ I000}$	Rounds to thousands.
$\text{Fix} \text{ I00}$	Rounds to hundreds.
$\text{Fix} \text{ I0}$	Rounds to tens.
$\text{Fix} \text{ I}$	Rounds to ones.
$\text{Fix} \text{ 0.1}$	Rounds to nearest tenth.
$\text{Fix} \text{ 0.01}$	Rounds to nearest hundredth.
$\text{Fix} \text{ } \square$	Removes fixed-decimal setting.

These Place Value keys also work with Fix . See Place Value.

Problem Solving

Problem Solving lets you practice and test your skills.

To enter Problem Solving, press \diamond .

You can choose either **AUTO** (automatic) or **MAN** (manual) mode.

AUTO Mode

In \diamond (Problem Solving) **AUTO** mode (the default), the TI-10 presents problems with one element missing, for example: $5+2=?$ or $5+?=7$ or $5?2=7$. You can select the type of problem and choose from three levels of difficulty. The default is addition at Level 1.

Level of Difficulty. While in \diamond **AUTO** mode, press $\text{Mode} \leftarrow \rightarrow$ to access the menu. Press \rightarrow or \leftarrow to select the level of difficulty (1, 2, or 3). Press $\text{Enter} \text{ Mode}$, and the TI-10 will present problems at the selected level. Or, while in \diamond mode, press \rightarrow to advance to the next level. After Level 3, pressing \rightarrow again returns you to Level 1.

Type of Problem. While in \diamond **AUTO** mode, press $\text{Mode} \leftarrow \rightarrow$ to access the menu. Press \rightarrow or \leftarrow to select the type of problem — addition (+), subtraction (-), multiplication (×), division (÷), or find the operator (?). Press $\text{Enter} \text{ Mode}$, and the TI-10 will present problems of the selected type.

Procedure. When a problem is presented:

1. Enter an answer and press Enter .
2. If your answer is correct, the display shows **YES**, clears the screen, and presents another problem.
3. If your answer is not correct, the display shows **NO** and indicates whether the correct solution is less than < or greater than > the answer that you entered.
4. The incorrect answer is cleared from the display so you can enter another answer to that same problem.
5. If you enter three incorrect answers to a given problem, the TI-10 shows the correct answer, clears that problem, and presents a new problem.

Scoreboard. The TI-10 shows a Scoreboard after every fifth problem. Every correct solution you entered registers one **YES** in the Scoreboard, and three incorrect answers in a row register one **no** in the Scoreboard. After 100, the Scoreboard returns to zero.

Press Mode to display the Scoreboard at any time. The Scoreboard is then replaced by the **AUTO / MAN** menu after a few seconds. Press Mode again to return to the problem.

MAN Mode

Using \diamond (Problem Solving) **MAN** (manual) mode, you can compose your own problems.

1. Press Mode to access the menu.
2. Press \rightarrow to underline **MAN**.
3. Press $\text{Enter} \text{ Mode}$.

The TI-10 is ready for you to enter your problem and your solution. The TI-10 accepts only non-negative integers in this mode. To indicate a missing element, press \square .

In \diamond (Problem Solving), press Auto to change between **AUTO** and **MAN** mode. **Auto** shows in the top line of the display when Problem Solving **AUTO** is selected.

In \diamond **MAN** mode, it is possible to enter a problem that has one solution, multiple solutions, or no solution. The TI-10 tells you how many solutions the problem has.

- Problems with one missing element generally have only one solution. You get three tries. After three incorrect answers, the calculator displays the correct answer and then clears the display so you can enter a new problem.
- Problems with two missing elements may have multiple solutions. For example: $?+?=5$ has 6 solutions; $?x?=24$ has 8 solutions. For multiple-solution problems, the question mark replaces the operands. Question marks may not appear in the place of the operator or the answer. These problems are not cleared after a correct solution or after three incorrect answers. Instead, the problem remains so that you can enter other solution sets. To clear the problem at any time, press Clear .
- When the answer to a problem is not a positive integer (such as $9\div 2$), the TI-10 indicates that the problem has zero solutions.

However, if you enter an answer, it will tell you whether your answer is less than < or greater than > the correct answer.

Inequalities. Instead of entering an equation, you can test an inequality using (<) or (>). You get only one try because the inequality statement is either true or false. With inequalities you can enter decimals.

To exit Problem Solving, press (◊) again. All Problem Solving history will be cleared.

Place Value (■) (1000) (100) (10) (1) (0.1) (0.01)

In (◊) (Problem Solving) **MAN** mode, you can access the Place Value menu by pressing (Mode) (◄) .

- *What is the place value of a given digit?* Enter a number. To determine the whole number place or the decimal place of a given digit, press (■) and then press the digit in question.

For a number with a repeated digit, press the given digit once for the first occurrence, twice for the second occurrence, etc. Each time you press the given digit in succession, the display shifts to the next occurrence of the digit to the left of the first occurrence and shows the place value for that occurrence.

- *How many ones, tens, hundreds, thousands, tenths, or hundredths are in a given number?* Press (Mode) (◄) , if necessary underline **11 -**, (default), and press (Enter) (Mode) . Enter the number to be analyzed, press (■) , and then press (1) , (10) , (100) , (1000) , (0.1) , or (0.01) .
- *What digit of a number is in a given place?* Press (Mode) (◄) , underline **- 1 -**, and press (Enter) (Mode) . Enter the number to be analyzed, press (■) , and then press (1) , (10) , (100) , (1000) , (0.1) , or (0.01) . The answer appears briefly and then clears so you can press another digit or Place Value key.

Once Place Value is active, it is not necessary to press (■) before each digit or place that you wish to examine for a given number. You must press (Clear) before entering a new number to analyze. Then you must activate Place Value again by pressing (■) .

To exit Place Value, press (Clear) .

Error Conditions

Arith Error	Arithmetical error.
Syn Error	Syntax error.
÷ 0 Error	Attempting to divide by zero.
Mem Error	Error in attempting to store entry in memory.
Op Error	Error following steps for using Op1 .
Overflow Error	Overflow. Result is too large for the display.
Underflow Error	Underflow. Result is too small for the display.

In some cases, (Clear) restores the last display before the error message appeared.

Errors appear in history as **Error**.

In Case of Difficulty

If you get unexpected results:

- Review the instructions to be certain calculations were entered correctly.
- Check the mode (Mode) setting and rounding (■) function.
- Reset the TI-10. See Clearing, Correcting, and Resetting.
- Check the battery to ensure that it is fresh and properly installed. See Battery Replacement. Change the battery when:
 - (Power) does not turn the unit on, or
 - the screen goes blank, or
 - you get unexpected results.

To continue using the TI-10 until you can change the battery:

1. Expose the solar panel to brighter light.
2. Reset the TI-10. See Clearing, Correcting, and Resetting.

Battery Replacement

The TI-10 uses the CR2025 battery, or the equivalent.

1. Place the protective cover over the TI-10, and then turn the calculator face down.

2. Remove the screws from the back of the case, using a small Phillips screwdriver.
3. Carefully separate the front from the back, starting from the bottom of the case.

Caution: Be careful not to damage any internal parts.
4. Remove the old battery, using a small Phillips screwdriver, if necessary.

5. Replace with a new battery, and then replace the back of the case.

Caution: Avoid contact with other TI-10 components while changing the battery.

6. If necessary, reset the TI-10. See Clearing, Correcting, and Resetting.

Caution: Dispose of old batteries properly. Do not incinerate batteries or leave where a child can find them.

TI Product Service and Warranty Information

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 Phone: 1-800-TI-CARES (1-800-842-2737)
 For U.S., Canada, Mexico, Puerto Rico, and Virgin Islands only
 Home Page: education.ti.com

For Technical Questions

Phone: 1-972-917-8324

For Product (hardware) Service

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For information about the length and terms of the warranty, refer to your package and/or to the warranty statement enclosed with this product, or contact your local Texas Instruments retailer/distributor.

On/Off	On/Off	\leftarrow
AC Clear		\leftarrow
$+$	$2 + 3 =$	$2 + 3 = 5$
$-$	$7 - 4 =$	$7 - 4 = 3$
\times	$2 \times 4 =$	$2 \times 4 = 8$
\div	$6 \div 3 =$	$6 \div 3 = 2 \text{ r } 0$
↵	$\text{↵} \text{ ↵} \text{ ↵}$	$2 + 3 = 5$ $7 - 4 = 3$
↵	↵	$7 - 4 = 3$ $2 \times 4 = 8$
$\leftarrow \rightarrow$	$\leftarrow \leftarrow \leftarrow 4 \rightarrow \rightarrow 2 =$	$74 - 42 = 32$

$+$	AC Clear	\leftarrow
$+$	$1 + 1 =$	$1 + 1 = 2$
	$1 + 2 =$	$1 + 2 = 3$
	$1 + 3 =$	$1 + 3 = 4$
	$1 + 4 =$	$1 + 4 = 5$
↵	$\text{↵} \text{ ↵} \text{ ↵}$	$1 + 1 = 2$ $1 + 2 = 3$
↵	↵	$1 + 2 = 3$ $1 + 3 = 4$
	↵	$1 + 3 = 4$ $1 + 4 = 5$

Clear \leftarrow	AC Clear	\leftarrow
	$6 + 33$	$6 + 33$
Clear	Clear	\leftarrow
	$6 + 1 =$	$6 + 1 = 7$

Clear \leftarrow (continued)	$6 + 21$	$6 + 21$
\leftarrow	$6 + 2 =$	$6 + 2 = 8$
	$7 + 3 \leftarrow \leftarrow \leftarrow 6 =$	$6 + 3 = 9$
	$6 - 5 \leftarrow \leftarrow + 4 =$	$6 + 4 = 10$

\div Mode	AC Clear	\leftarrow
\div	$9 \div 4 =$	$9 \div 4 = 2 \text{ r } 1$
	$\text{Mode} \rightarrow \text{Enter}$	\div QR \div
	Clear	\div $9 \div 4 = 2 \text{ r } 1$
	$9 \div 4 =$	\div $9 \div 4 = 2.25$

\cdot Mode	AC Clear	\leftarrow
\cdot	$6 \cdot 3 + 2 \cdot 4 =$	$6 \cdot 3 + 2 \cdot 4 = 8.7$
	$4 \cdot 2 \times 3 \cdot 1 =$	$4 \cdot 2 \times 3 \cdot 1 = 13.02$
	$\text{Mode} \rightarrow \text{Enter}$	\div QR \div
	$96 \div 3 \div 2 \div 52 =$	\div $96 \div 3 \div 2 \div 52 = 38.21428571$

$(-)$	AC Clear	\leftarrow
$(-)$	$5 + (-) 2 =$	$5 + -2 = 3$
	$5 - (-) 2 =$	$5 - -2 = 7$
	$4 \times (-) 2 =$	$4 \times -2 = -8$

AC Clear

3 × 4 + 2 =

3 × (4 + 2) =

3 × 4 + 2 = 14

3 × (4 + 2) = 18

M+ M-

AC Clear

4 + 2 =

M+ M+ M

4 + 2 = 6

M

1 + 1 =

1 + 1 = 2

M

M- M- M

1 + 1 = 2

M

MR/MC MR/MC

4 ←

M

+ 1 =

4 + 1 = 5

MR/MC MR/MC Clear

←

Op1

AC Clear

Op1 Op1 + 1 Op1

+1

Op1

1 Op1

1 + 1

1 2

Op1

Op1

2 + 1

2 3

Op1

Op1

3 + 1

3 4

Op1

Op1

4 + 1

4 5

Op1

Op1

1 + 1 = 2

2 + 1 = 3

Op1

Op1

2 + 1 = 3

3 + 1 = 4

Fix 0.1 0.01 L IO IO0 IO00

AC Clear

4 2 3 9 4 × 9 7 3

8 2 =

4128.412508

Fix 0.1 0.01 L IO IO0 IO00 (continued)

Fix IO00

Fix IO00

Fix

4000.

Fix IO0

Fix IO0

Fix

4100.

Fix IO

Fix IO

Fix

4130.

Fix L

Fix L

Fix

4128.

Fix 0.1

Fix 0.1

Fix

4128.4

Fix 0.01

Fix 0.01

Fix

4128.41

Fix .

Fix .

4128.412508

AC Clear

Auto

8 + 3 = ?

1 1 Enter

Auto

8 + 3 = 11

YES

Auto

3 + ? = 8

5 Enter

Auto

3 + 5 = 8

YES

Auto

9 + 7 = ?

1 5 Enter

Auto

9 + 7 > 15

NO

1 8 Enter

Auto

9 + 7 < 18

NO

1 7 Enter

Auto

9 + 7 < 17

NO

Auto

9 + 7 = 16

YES

Auto

4 + ? = 6

2 Enter

Auto

4 + 2 = 6

YES

Auto

8 + ? = 13

5 Enter

Auto

8 + 5 = 13

YES

Auto

YES NO

4 1

Mode

AC Clear

1 2 3

Mode Enter

Auto
1 2 3
- #

Mode

Auto
6+400=?

4 0 6 Enter

Auto
6+400=406
YES

+ - x ÷ ?

Mode Enter

Auto
+ - x ÷ ?

Mode

Auto
10x40=?

4 0 0 Enter

Auto
10x40=400
YES

Mode Enter

Auto
70-40=?

Mode

2 0 Enter

Auto
70-40>20
NO

3 0 Enter

Auto
70-40=30
YES

Mode ? < >

AC Clear

Mode Mode Enter

AUTO MAN

Mode

1 4 = ? = 1 0 Enter

Auto
14-?=10
1 SOL

4 Enter

Auto
14-4=10
YES

? x ? = 2 4 Enter

Auto
?x?=24
8 SOL

8 Enter 3 Enter

Auto
8x3=24
YES

Auto

Auto
?x?=24

Clear

Auto

7 x 6 < 4 3 Enter

Auto
7x6<43
YES

1 5 ÷ 3 > 4 Enter

Auto
15÷3>4
YES

Mode [L] [0.01] [0.1] [1] [10] [100] [1000]

AC Clear

Mode Mode Enter

AUTO MAN

Mode

4 3 7 9 . 6 5

Auto
4379.65

3

Auto
4379.65
3→100

5

Auto
4379.65
5→100

Clear 7 6 5 3 . 4 9

Auto
7653.49

[1000]

Auto
7653.49
7→1000

[0.01]

Auto
7653.49
765349

Mode Enter

Auto
11 . -1 .

Mode

Auto
7653.49

[10]

Auto
7653.49
5→10

[0.1]

Auto
7653.49
4→0.1

 **TEXAS
INSTRUMENTS**

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