

# TEXAS INSTRUMENTS

## SCIENTIFIC

# TI-36 SOLAR

QUICK  
REFERENCE  
GUIDE



# TI-36 SOLAR

## QUICK REFERENCE GUIDE

This Quick Reference Guide provides you with condensed information about operating the calculator. Refer to the *TI-36 Solar Guidebook* for complete details and examples.

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## Turning the Calculator On and Off

The calculator turns on automatically when you expose the solar cell panel to an adequate light source. After it first turns on, always press **[AC]** to make sure the calculator is properly cleared before beginning your calculations.

**Note:** When the calculator first turns on, random segments and indicators may appear in the display or random values may be stored in the memory and statistical registers. These random values are cleared when you press **[AC]**.

After you press **[AC]**, "0 ." and "DEG" appear in the display. The calculator is then ready for you to begin your calculations.

The calculator turns off automatically when the solar cell panel is no longer exposed to the light source. (You can easily turn the calculator off by closing the carrying case.) The display, any pending operations, the automatic constant, the memory, and the statistical registers are cleared.

**Note:** The calculator does not actually turn off until approximately 10 to 20 seconds after you remove it from the light source. If you re-expose the solar panel to light within approximately 10 seconds, the calculator is not cleared.

## Clearing the Calculator

### [CE/C]—Clear Entry/Clear Key

This key clears pending operations, incorrect entries, or error conditions.

- ▶ To clear the display and all pending operations, press **[CE/C]** twice.
- ▶ To clear an incorrect numerical entry, press **[CE/C]** once.
- ▶ To clear an error condition, press **[CE/C]** once.

### [AC]—All Clear Key

This key clears the calculator completely. The **[AC]** key:

- ▶ Clears the display, all pending operations, the memory, the automatic constant, the statistical registers, and any error condition.
- ▶ Sets the angle mode for degrees.
- ▶ Sets the display format for floating-decimal notation.
- ▶ Sets the calculator to the decimal number mode.

**Note:** When performing calculations, it is a good practice to clear the calculator with **[CE/C]** instead of **[AC]**.

## The Keyboard

Most of the calculator's keys can perform more than one function. The **[INV]**, **[2nd]**, and **[MODE]** keys give you access to these alternate functions.

### **[INV]**—Inverse Function Key

This key enables you to perform the inverse (opposite) operations of the keys listed below.

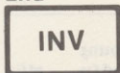
Key	Function	Inverse
<b>[sin]</b>	sine	arcsine
<b>[cos]</b>	cosine	arccosine
<b>[tan]</b>	tangent	arctangent
<b>[log]</b>	common logarithm	$10^x$
<b>[lnx]</b>	natural logarithm	$e^x$
<b>[y<sup>x</sup>]</b>	y to the xth power	the xth root of y
<b>[hyp]</b>	hyperbolic functions	inverse hyperbolic functions

## The Keyboard (Continued)

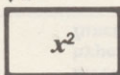
### [2nd]—Second Function Key

This key enables you to perform the “second” function that is marked above and to the left of a key.

**2nd**



**$\sqrt{x}$**

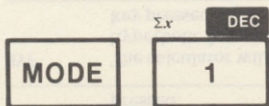


To perform a second function, press [2nd] and then press the appropriate function key.

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## [MODE]—Mode Key Sequence

This key enables you to select the “modes” that are marked on the lower right side of the [1], [2], [3], [4], [5], and [6] keys.



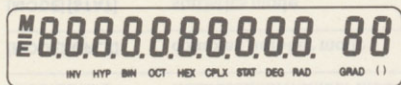
To select any of the modes listed below, press [MODE] and then press the appropriate key.

Key Sequence	Mode Setting
[MODE][DEC]	decimal number mode
[MODE][BIN]	binary number mode
[MODE][OCT]	octal number mode
[MODE][HEX]	hexadecimal number mode
[MODE][CPLX]	complex number mode
[MODE][STAT]	statistics mode

Normally, you should keep the calculator in the decimal mode. Some of the calculator's normal operating features are limited in the other modes.

## The Display

The display shows a maximum of ten digits, although the calculator's internal display register retains a maximum of twelve digits. To provide additional information about the calculator, special indicators may also appear in the display.



Indicator	Meaning
M	The memory contains a number other than zero.
E	An error condition has occurred. To clear the error, press [CE/C] or [AC].
INV	The calculator will access the alternate function of the next key pressed.
HYP	The calculator will access the hyperbolic function of the next key pressed.



<b>Indicator</b>	<b>Meaning</b>
<b>BIN</b>	The calculator is in the binary number mode.
<b>OCT</b>	The calculator is in the octal number mode.
<b>HEX</b>	The calculator is in the hexadecimal number mode.
<b>CPLX</b>	The calculator is in the complex number mode.
<b>STAT</b>	The calculator is in the statistics mode.
<b>DEG</b>	The calculator is in the degree mode.
<b>RAD</b>	The calculator is in the radian mode.
<b>GRAD</b>	The calculator is in the grad mode.
<b>( )</b>	There are one or more open parentheses.

After you select a display format, all results are displayed in this format until you select another one.

### **[2nd][FD]—Floating-Decimal Notation** **Key Sequence**

This key sequence selects floating-decimal notation, in which results are displayed in the range:

– 9999999999 to – 0.000000001,  
0,  
0.000000001 to 9999999999

**Note:** Any results outside of this range are automatically displayed in scientific notation.

### **[2nd][Sci]—Scientific Notation** **Key Sequence**

This key sequence selects scientific notation, in which a result is expressed as a base value (mantissa) times 10 raised to some power (exponent).

In scientific notation, the calculator always displays “normalized” results. (That is, the result has a single digit to the left of the decimal point.)

## **[2nd] [Eng]— Engineering Notation Key Sequence**

This key sequence selects engineering notation. This is similar to scientific notation, except that all exponents are given as multiples of three.

## **[2nd] [Fix]— Fixed-Decimal Key Sequence**

This key sequence enables you to set the number of decimal places displayed in a result.

- ▶ To set the number of decimal places, press **[2nd] [Fix]** and then press the appropriate digit key (0–9).
- ▶ To remove the fixed-decimal setting, press **[2nd] [Fix] [.]**.

If a result has more than the selected number of decimal places, the result is rounded. If a result has less than the selected number of decimal places, trailing zeros are inserted.

## **Changing Display Formats**

By changing the display format, you can convert the result of a calculation from one format to another.

**Note:** Because **[2nd] [FD]**, **[2nd] [Scil]**, **[2nd] [Eng]**, and **[2nd] [Fix]** affect only the result of a calculation, you cannot simply enter a number and convert it. In this case, you need to press **[=]** after entering the number.

## Data Entry Keys

### **[+/-]—Change Sign Key**

This key changes the sign of the number in the display. In the binary, octal, or hexadecimal number modes, however, the [+/-] key calculates the two's complement of the number in the display.

### **[2nd][ $\pi$ ]-Pi Key Sequence**

This key sequence enters the value of pi to twelve digits, 3.14159265359. The display shows the value rounded to ten digits, 3.141592654.

### **[2nd][Rnd]-Random Number Key Sequence**

This key sequence displays a random number from 0.000 through 0.999.

### **[EXP]-Exponent Entry Key**

This key enables you to enter a number with an exponent. You can enter a number as small as  $\pm 1 \times 10^{-99}$  and as large as  $\pm 9.999999999 \times 10^{99}$ .

1. Enter the mantissa. If it is negative, press [+/-].
2. Press [EXP]. “00” appears in the right side of the display. (If you press [EXP] without first entering a mantissa, the calculator sets the mantissa as 1 and displays “1 . 00”.)
3. Enter the exponent. If it is negative, press [+/-].

## Memory Operations

### **[STO]—Store Key**

This key clears the memory and then stores the number currently in the display. You can always clear the memory by pressing **[STO]** when 0 is in the display.

### **[RCL]—Recall Key**

This key displays (recalls) the number stored in memory, without affecting the memory contents.

### **[2nd][EXC]—Exchange Key Sequence**

This key sequence exchanges the number in the display with the number in memory. For instance, the key sequence 3 **[2nd][EXC]** stores the number 3 in memory and displays the number that was previously in the memory.

### **[SUM]—Sum Key**

This key adds the number in the display to the number in memory. For instance, if 5 is in memory and you press 3 **[SUM]**, the number in memory is then 8. The 3 remains in the display.

**Note:** If you want to add numbers to the current contents of memory, use **[SUM]**.

However, if you are beginning a new problem, be sure to use **[STO]** to store the first number in memory. (This clears the previous contents.) You can then use **[SUM]** to add subsequent numbers.

# Algebraic Operating System

The AOSTM algebraic hierarchy completes all operations according to their relative priorities, which are listed below in descending order.

Priority	Operations
1. (highest)	reciprocal, square, square root, cube root, logarithmic, percent, factorial, angle conversions, trigonometric, hyperbolic
2.	universal powers and roots
3.	multiplication and division
4.	addition and subtraction
5. (lowest)	equals

Operations in priority 1 are immediate functions that are performed as soon as you press the operation keys.

Operations in priorities 2, 3, and 4 are completed by any operation with the same priority or with a lower priority.

The [=] key completes all operations.

## Pending Operations

A pending operation is any operation that is delayed until you press a key with an equal or lower priority. If you enter  $4 \times 5$ , for example, the result is not displayed until you complete the operation by pressing an appropriate key such as [=]. Until completed,  $4 \times 5$  creates a pending multiplication.

Because the operation keys in priorities 2, 3, and 4— $[y^x]$ ,  $[INV][y^x]$ ,  $[\times]$ ,  $[+]$ ,  $[+]$ , and  $[-]$ —create pending operations, they are called the **pending operation keys**.

The calculator allows you to enter a maximum of six pending operations. If you attempt to enter a seventh, an error condition occurs. All pending operations are cleared when you press  $[CE/C]$ ,  $[AC]$ ,  $[a]$ ,  $[b]$ ,  $[\Sigma +]$ , or  $[2nd][\Sigma -]$ .

## Parentheses

A series of numbers and operations enclosed in parentheses is given priority over operations outside the parentheses. Within each level of parentheses, the calculator operates according to the rules of the algebraic hierarchy.

### $[(], [)]$ —Parenthesis Keys

These keys open and close a parenthetical expression. With each pending operation, you can enter up to 15 levels of open parentheses.

## Correcting Entry Errors

If you enter an incorrect number or function, you can always clear the calculation and begin again. In many instances, however, you can correct the entry error without clearing the entire calculation.

### **[CE/C]—Clear Entry/Clear Key**

This key clears pending operations, incorrect entries, or immediate functions.

- To clear all pending operations, press **[CE/C]** twice.
- To clear a numerical entry, press **[CE/C]** once.

When clearing an incorrect number, be sure to press **[CE/C]** before you press **[(,)]**, or a pending operation key.

- To clear an immediate function, press **[CE/C]** once.

### **[2nd][x↔y]—x Exchange y Key Sequence**

This key sequence exchanges the values of  $x$  and  $y$  in universal power and root calculations, the minuend and subtrahend in subtraction, and the divisor and dividend in division.



## Correcting Numbers and Immediate Functions

If you enter an incorrect number or immediate function, use the **[CE/C]** or **[2nd] [x $\div$ y]** keys to correct the entry. Then continue with the problem.

**Note:** You can often correct an immediate function by performing the “opposite” operation. If you press **[x $^2$ ]**, for example, you can correct the operation by pressing the **[2nd] [ $\sqrt{x}$ ]** key sequence.

## Correcting Pending Operations

If you press an incorrect pending operation key, you may or may not be able to correct the operation.

- If the incorrect operation has an equal or higher priority than the intended operation, you can press the correct operation key immediately after the incorrect one and continue with the calculation.
- If the incorrect operation has a lower priority than the intended operation, simply pressing the correct key may not correct the problem. If there are any existing pending operations, pressing a lower-priority operation key completes the previous pending operations. In this case, you should press **[CE/C] [CE/C]** to clear the calculation and begin again.

## Reciprocals, Powers, and Roots

The  $[1/x]$ ,  $[x^2]$ ,  $[2nd][\sqrt{x}]$ , and  $[2nd][\sqrt[3]{x}]$  keys calculate the reciprocal, square, square root, and cube root of the displayed number.

### $[y^x]$ —Universal Power Key

This key raises any positive number to any power, within the range of the calculator. To use this key:

1. Enter the number ( $y$ ) that you want to raise to a power.
2. Press  $[y^x]$ .
3. Enter the power ( $x$ ).
4. Press  $[=]$  or any key that completes the operation.

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### $[INV][y^x]$ —Universal Root Key Sequence

This key sequence calculates any root of any positive number, within the range of the calculator. To use this key sequence:

1. Enter the number ( $y$ ) whose root you want to find.
2. Press  $[INV][y^x]$ .
3. Enter the root ( $x$ ).
4. Press  $[=]$  or any key that completes the operation.

## Constant Calculations

The constant register is set automatically when you perform a calculation that uses  $[+]$ ,  $[-]$ ,  $[\times]$ ,  $[+]$ ,  $[y^x]$ , or  $[\text{INV}][y^x]$ . The register uses the number entered **after** the function key as the constant number.

When you enter another number and press  $[=]$ , the calculator completes the problem using the number and function in the constant register.

The constant register is cleared when you press  $[\text{AC}]$ ,  $[\text{CE/C}][\text{CE/C}]$ ,  $[a]$ ,  $[b]$ , or a pending operation key.

## Logarithmic Keys

### $[\ln x]$ , $[\log]$ —Logarithm Keys

The  $[\ln x]$  key calculates the natural logarithm (base  $e$ ) of the number in the display. (The value of  $e$  is 2.718281828.)

The  $[\log]$  key calculates the common logarithm (base 10) of the number in the display.

### $[\text{INV}][\ln x]$ , $[\text{INV}][\log]$ —Antilogarithm Keys

The  $[\text{INV}][\ln x]$  key sequence calculates the value of  $e$  raised to the power of the number in the display.

The  $[\text{INV}][\log]$  key sequence calculates the value of 10 raised to the power of the number in the display.

## **[2nd][%]—Percent Key Sequence**

This key sequence automatically divides the number in the display by 100, which converts the number to its equivalent decimal percent. You can use this key sequence to calculate percentages, add-ons, discounts, and percentage ratios.

### **Percentages**

**[×] n [2nd][%][=]**

multiplies the principal amount by n%

### **Add-ons**

**[+] n [2nd][%][=]**

adds n% to the principal amount

### **Discounts**

**[-] n [2nd][%][=]**

subtracts n% from the principal amount

### **Percentage Ratios**

**[÷] n [2nd][%][=]**

divides the principal amount by n%

The principal amount is the number in the display immediately after you press [×], [+], [-], or [÷].

## Factorials

### **[2nd][x!]**—Factorial Key Sequence

This key sequence calculates the factorial of the displayed number. The displayed number must be a non-negative integer less than or equal to 69; otherwise, an error condition occurs.

## Combinations and Permutations

A combination is an arrangement of objects in which the order is not important. A permutation is an arrangement in which the order is important.

### **[2nd][nCr]**—Combination Key Sequence

This key sequence calculates the number of combinations of  $n$  items taken  $r$  at a time.

1. Enter  $n$  and press **[a]**.
2. Enter  $r$  and press **[b]**.
3. Press **[2nd][nCr]**.

### **[2nd][nPr]**—Permutation Key Sequence

This key sequence calculates the number of permutations of  $n$  items taken  $r$  at a time.

1. Enter  $n$  and press **[a]**.
2. Enter  $r$  and press **[b]**.
3. Press **[2nd][nPr]**.

## Angle Mode Selection

### [DRG]—Angle Mode Change Key

This key changes the angle mode without affecting the angle in the display. The calculator is automatically set to the degree mode ("DEG" is displayed) when you press [AC]. Each time you press [DRG], the angle mode advances in the following order: radian ("RAD" is displayed), grad ("GRAD" is displayed), and then back to degree.

### [2nd][DRG▶]—Angle Conversion Key Sequence

This key sequence changes the angle mode and converts the angle in the display to the new units.

## Trigonometric Calculations

### [sin], [cos], [tan]—Trig Keys

These keys calculate the sine, cosine, and tangent of the angle in the display.

**Note:** The calculator interprets the angle in the units (DEG, RAD, or GRAD) selected by the [DRG] or [2nd][DRG▶] keys.

### [INV][sin], [INV][cos], [INV][tan]—Inverse Trig Key Sequences

These keys calculate the angle (in the units selected) whose sine, cosine, or tangent is in the display.

# Hyperbolic Functions

## [hyp]—Hyperbolic Key

This key enables you to use the trig keys to perform hyperbolic functions. The inverse function of the [hyp] key enables you to perform inverse hyperbolic functions.

**Note:** For inverse hyperbolic functions, the [INV] key remains in effect until you press the appropriate trig key.

Key Sequence	Function
[hyp] [sin]	$\sinh$
[INV] [hyp] [sin]	$\sinh^{-1}$
[hyp] [cos]	$\cosh$
[INV] [hyp] [cos]	$\cosh^{-1}$
[hyp] [tan]	$\tanh$
[INV] [hyp] [tan]	$\tanh^{-1}$

## Polar/Rectangular Conversions

### **[2nd][P►R]—Polar to Rectangular Conversion Key Sequence**

To convert from polar to rectangular:

1. Select the correct angle mode.
2. Enter the  $r$  coordinate and press **[a]**.
3. Enter the  $\theta$  coordinate and press **[b]**.
4. Press **[2nd][P►R]** to display the  $x$  coordinate.
5. Press **[b]** to display the  $y$  coordinate.

### **[2nd][R►P]—Rectangular to Polar Conversion Key Sequence**

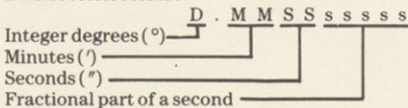
To convert from rectangular to polar:

1. Select the correct angle mode.
2. Enter the  $x$  coordinate and press **[a]**.
3. Enter the  $y$  coordinate and press **[b]**.
4. Press **[2nd][R►P]** to display the  $r$  coordinate.
5. Press **[b]** to display the  $\theta$  coordinate.



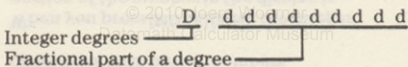
## Deg/Min/Sec and Decimal Degrees

In deg/min/sec, angles are represented by the D.MMSSsssss format.



When you enter minutes and seconds, remember to include zeros where needed to place the digits in the proper positions. For example, the angle  $9^{\circ}7'5''$  is entered as 9.0705.

In decimal degrees, angles are represented by the D.ddddddddd format.



### [2nd] [►DMS], [2nd] [►DD] — DMS and DD Conversion Key Sequences

The [2nd] [►DMS] key sequence converts an angle from decimal degrees to deg/min/sec. Enter the angle as D.ddddddddd and press [2nd] [►DMS].

The [2nd] [►DD] key sequence converts an angle from deg/min/sec to decimal degrees. Enter the angle as D.MMSSsssss and press [2nd] [►DD].

**Note:** Although these angles are expressed in degrees, the calculator can perform these conversions in any angle mode.

## Number System Modes

### **[MODE][DEC]—Decimal Mode Key Sequence**

This key sequence selects the decimal mode. When you press **[MODE][DEC]**, the number in the display is automatically converted to its decimal equivalent.

**Note:** Normally, you should keep the calculator in the decimal mode. Some of the calculator's normal operating features are limited in the other modes.

### **[MODE][BIN]—Binary Mode Key Sequence**

This key sequence selects the binary mode. In this mode, you can only perform arithmetic operations with binary numbers.

When you press **[MODE][BIN]**, the integer portion of the number in the display is automatically converted to its binary equivalent. (If you attempt to convert a number that is outside the range of binary numbers, an error condition occurs.)

You can enter positive binary numbers as large as 11111111 (9 digits). Numbers beyond this are interpreted as negative (two's complement) numbers.

## **[MODE][OCT]—Octal Mode Key Sequence**

This key sequence selects the octal mode. In this mode, you can only perform arithmetic operations with octal numbers.

When you press **[MODE][OCT]**, the integer portion of the number in the display is automatically converted to its octal equivalent. (If you attempt to convert a number that is outside the range of octal numbers, an error condition occurs.)

You can enter positive octal numbers as large as 3777777777. Numbers beyond this are interpreted as negative (two's complement) numbers.

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## **[MODE][HEX]—Hexadecimal Mode Key Sequence**

This key sequence selects the hexadecimal mode. In this mode, you can only perform arithmetic operations with hexadecimal numbers.

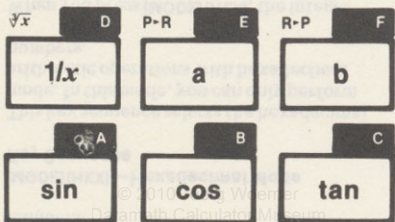
When you press **[MODE][HEX]**, the integer portion of the number in the display is automatically converted to its hexadecimal equivalent. (If you attempt to convert a number that is outside the range of hexadecimal numbers, an error condition occurs.)

(continued)

## Number System Modes (Continued)

You can enter positive hexadecimal numbers as large as 2540BE3FF. Numbers from FDABF41C01 through FFFFFFFF are interpreted as negative (two's complement) numbers.

To enter hexadecimal numbers with the letters A through F, use the keys shown below.



Although B and D are shown as uppercase letters on the keyboard, they are displayed as lowercase “b” and “d”. If you enter ABCD, for example, the display shows “AbCd”.

### Two's Complement

To display the two's complement of the number in the display, press [+/-].

## Complex Number Mode

### [MODE][CPLX]—Complex Number Mode Key Sequence

This key sequence selects the complex number mode, indicated by “CPLX” in the display. In the complex number mode, some of the calculator’s normal operating features are limited, as described below.

- ▶ All arithmetic operations are completed in the order in which they are entered. (The AOSTM system does not operate in the complex number mode.)
- ▶ Immediate functions are performed only on the number in the display, not on the complex number.
- ▶ You can perform combinations, permutations, and polar/rectangular conversions.

### Entering Complex Numbers

To enter a complex number:

1. Press [MODE][CPLX].
2. Enter the real part and press [a].
3. Enter the imaginary part and press [b].

You can add, subtract, multiply, and divide complex numbers. When the calculation is complete, the real part of the result appears in the display. To display the imaginary part, press [b].

## Statistics Mode

### **[MODE][STAT]—Statistics Mode Key Sequence**

This key sequence selects the statistics mode, indicated by "STAT" in the display. In this mode, some of the normal operating features are limited, as described below.

- ▶ You can enter a maximum of 3 pending operations.
- ▶ You cannot perform permutations, combinations, or polar/rectangular conversions.

### **Clearing the Statistical Registers**

Before beginning a new statistics problem, you must clear the statistical registers.

**Caution:** Simply pressing **[MODE][STAT]** does not always clear the registers. The registers are cleared only when you use the **[MODE]** key to **change from one mode to another** or when you press **[AC]**. If the calculator is already in the statistics mode when you press **[MODE][STAT]**, the registers are not cleared.

To make sure the registers are properly cleared, use the following key sequence. This sequence clears the registers but does not affect the calculator's memory.

**[MODE][DEC][MODE][STAT]**

If you do not need to retain the memory, you can clear the registers by pressing **[AC][MODE][STAT]**.

## Entering Statistical Data

To enter statistical data values:

1. Press **[MODE][DEC][MODE][STAT]** to clear the statistical registers and enter the statistics mode.
2. Enter each data value and press the **[Σ+]** key. If you enter an incorrect value, remove it by reentering the value and pressing **[2nd][Σ-]**.

Each time you press **[Σ+]** or **[2nd][Σ-]**, the display shows the number of data values currently in the registers.

## Analyzing the Data Joerg Woerner Datamath Calculator Museum

After entering the data values, you can perform any of the following calculations.

Calculation	Key Sequence
mean	<b>[2nd][<math>\bar{x}</math>]</b>
“n weighted” standard deviation	<b>[2nd][<math>\sigma_n</math>]</b>
“n – 1 weighted” standard deviation	<b>[2nd][<math>\sigma_{n-1}</math>]</b>
sum of data values	<b>[2nd][<math>\Sigma x</math>]</b>
sum of squares	<b>[2nd][<math>\Sigma x^2</math>]</b>
number of data values	<b>[2nd][n]</b>

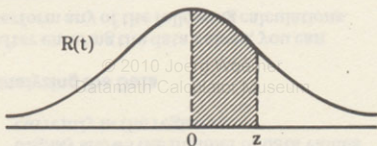
## Normal Distribution Keys

To use the normal distribution keys, select the statistics mode by pressing **[MODE][STAT]**.

### **[2nd][R(t)]**—Normal Distribution Key Sequence

This key sequence clears any pending operations and calculates the area between the mean (0) and  $z$ . This area, often called the “ $z$  score,” is expressed as a percentage of the total area under the curve.

To find  $R(t)$ , enter a value for  $z$  and press **[2nd][R(t)]**.



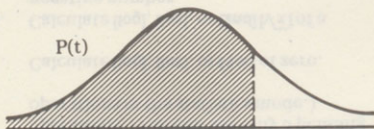
**Note:** When you use **[2nd][R(t)]** with a negative value for  $z$ , the area is displayed as a negative number.



## **[2nd][P(t)]—Normal Distribution Key Sequence**

This key sequence clears any pending operations and calculates the area to the left of  $z$ . This area is expressed as a percentage of the total area under the curve.

To find  $P(t)$ , enter a value for  $z$  and press **[2nd][P(t)]**.

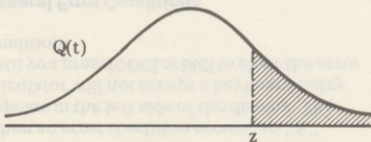


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## **[2nd][Q(t)]—Normal Distribution Key Sequence**

This key sequence clears any pending operations and calculates the area to the right of  $z$ . This area is expressed as a percentage of the total area under the curve.

To find  $Q(t)$ , enter a value for  $z$  and press **[2nd][Q(t)]**.



## Error Conditions

When an error condition occurs, an "E" appears in the left side of the display. The calculator will not accept a keyboard entry until you press **[CE/C]** or **[AC]** to clear the error condition.

### General Error Conditions

The error conditions listed in this section can occur in most calculator modes. These errors occur when you attempt to:

1. Calculate a result larger than  $\pm 9.999999999 \times 10^{99}$ .
2. Divide a number by zero.
3. Use more than 15 levels of open parentheses or more than 6 pending operations. (You can use only 3 pending operations in the statistics mode.)
4. Calculate **[log]**, **[lnx]**, or **[1/x]** of zero.
5. Calculate **[log]**, **[lnx]**, or **[2nd][√x]** of a negative number.
6. Use **[INV][y<sup>x</sup>]** to find an even root of a negative number.
7. Use **[y<sup>x</sup>]** to raise zero to the 0th power, or use **[INV][y<sup>x</sup>]** to calculate the 0th root of any number.

8. Use **[2nd][R►P]** when both  $x$  and  $y$  are zero or when the sum of the squares of  $x$  and  $y$  exceeds the upper limit of the calculator.
9. Calculate **[tan]** of  $90^\circ$  or  $270^\circ$ ,  $\pi/2$  or  $3\pi/2$  radians, 100 or 300 grads, or their rotational multiples such as  $450^\circ$ .
10. Calculate **[INV][sin]** or **[INV][cos]** when the absolute value of the displayed number is greater than 1.
11. Calculate **[INV][hyp][tan]** when the absolute value of the displayed number is greater than or equal to 1.
12. Calculate **[2nd][x!]** of a number that is not a positive integer less than or equal to 69.
13. Use **[2nd][nPr]** or **[2nd][nCr]** when  $n$  and  $r$  are not positive integers, or when  $r$  is not less than or equal to  $n$ .

(continued)

## Error Conditions (Continued)

### Statistical Error Conditions

The error conditions listed in this section occur only when the calculator is in the statistics mode. These errors occur when you attempt to:

1. Use **[Σ+]** to enter a data value (x) such that

$$|x| \geq 1 \times 10^{50}.$$

2. Use **[2nd][Σ-]** when there are no data values in the statistical registers.
3. Calculate **[2nd][ $\bar{x}$ ]**, **[2nd][ $\sigma_n$ ]**, or **[2nd][ $\sigma_{n-1}$ ]** when there are no data values.
4. Calculate **[2nd][ $\sigma_{n-1}$ ]** with only one data value.
5. Use more than 3 pending operations.

### Binary Mode Error Conditions

The error conditions listed in this section occur only when the calculator is in the binary number mode. These errors occur when you attempt to:

1. Calculate a result that is outside the range of binary numbers.
2. Use **[MODE][BIN]** to convert a number that is outside the range of binary numbers.

## Octal Mode Error Conditions

The error conditions listed in this section occur only when the calculator is in the octal number mode. These errors occur when you attempt to:

1. Calculate a result that is outside the range of octal numbers.
2. Use **[MODE][OCT]** to convert a number that is outside the range of octal numbers.

## Hexadecimal Mode Error Conditions

The error conditions listed in this section occur only when the calculator is in the hexadecimal number mode. These errors occur when you attempt to:

1. Calculate a result that is outside the range of hexadecimal numbers.
2. Use **[MODE][HEX]** to convert a number that is outside the range of hexadecimal numbers.

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