TI-34 MultiView™ Scientific Calculator Guidebook

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Contents

Getting Started

Examples

Each section is followed by instructions for keystroke examples that demonstrate the TI-34 MultiView™ functions.

Examples assume all default settings, as shown in the Modes section.

For more activities and examples, see the TI-34 MultiView Teacher Guide available at **education.ti.com/guides**.

Switching the Calculator On and Off

[on] turns on the TI-34 MultiView™ calculator [2nd] [off] turns it off. The display is cleared, but the history, settings, and memory are retained.

The APD™ (Automatic Power Down™) feature turns off the TI-34 MultiView™ calculator automatically if no key is pressed for about 5 minutes. Press [on] after APD. The display, pending operations, settings, and memory are retained.

Display Contrast

The brightness and contrast of the display can depend on room lighting, battery freshness, and viewing angle.

To adjust the contrast:

1. Press and release the [2nd] key.
2. Press [+] (to darken the screen) or [−] (to lighten the screen).

Home Screen

On the Home screen, you can enter mathematical expressions and functions, along with other instructions. The answers are displayed on the Home screen. The TI-34 MultiView screen can display a maximum of four lines with a maximum of 16 characters per line. For entries and expressions of more than 16 characters, you can scroll left and right (◀ and ▶) to view the entire entry or expression.

In the MathPrint™ mode, you can enter up to four levels of consecutive nested functions and expressions, which include fractions, square roots, exponents with ^, $x\sqrt{}$, and x^2.

When you calculate an entry on the Home screen, depending upon space, the answer is displayed either directly to the right of the entry or on the right side of the next line.

Special indicators may display on the screen to provide additional information concerning functions or results.

Indicator	Definition
2ND	2nd function.
FIX	Fixed-decimal setting. (See Modes section.)

SCI	Scientific notation. (See Modes section.)
DEG, RAD	Angle mode (degrees or radians). (See Modes section.)
L1, L2, L3	Displays above the lists in Data Editor and List Conversions.
⧗	The TI-34 MultiView™ calculator is performing an operation.
↑↓	An entry is stored in memory before and/or after the active screen. Press ▲ and ▼ to scroll.
← →	An entry or menu displays beyond 16 digits. Press ◀ and ▶ to scroll. (See Scrolling for more information.)

2nd Functions

2nd

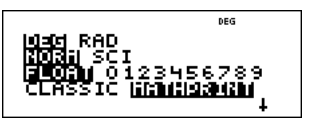
Most keys can perform two functions. The primary function is indicated on the key and the secondary function is displayed above it. Press 2nd to activate the secondary function of a given key. Notice that **2nd** appears as an indicator on the screen. To cancel it before entering data, press 2nd again. For example, **3** 2nd [$\sqrt[x]{}$] **125** enter calculates the cube root of 125 and returns the result, 5.

Modes

mode

Use mode to choose modes. Press ▼ ▲ ◀ ▶ to choose a mode, and enter to select it. Press clear or 2nd [quit] to return to the Home screen and perform your work using the chosen mode settings.

Default settings are shown.



DEG **RAD** Sets the angle mode to degrees or radians.

NORM **SCI** Sets the numeric notation mode. Numeric notation modes affect only the display of results, and not the accuracy of the values stored in the unit, which remain maximal.

NORM displays results with digits to the left and right of the decimal, as in 123456.78.

SCI expresses numbers with one digit to the left of the decimal and the appropriate power of 10, as in 1.2345678×10^5 (which is the same as 123456.78).

Note: [×10ⁿ] is a shortcut key to enter a number in scientific notation format. The result displays in the numeric notation format set in mode.

Note: In some restricted environments (for example, data editor and the [2nd] [recall] menu), the TI-34 MultiView™ calculator may display **E** instead of x10ⁿ.

FLOAT 0123456789 Sets the decimal notation mode.

FLOAT (floating decimal point) displays up to 10 digits, plus the sign and decimal.

0123456789 (fixed decimal point) specifies the number of digits (0 through 9) to display to the right of the decimal.

CLASSIC MATHPRINT

CLASSIC mode displays inputs and outputs in a single line.

MATHPRINT mode displays most inputs and outputs in textbook format. Choose the MathPrint™ mode for better visual confirmation that math expressions have been entered correctly and to better reinforce the correct math notation.

Note: Switching the mode between Classic and MathPrint clears calculator history and the stored operations (**op1** or **op2)** value.

Un/d n/d Determines how fractional results are displayed. Un/d displays results as a mixed number, if applicable. n/d displays results as a simple fraction.

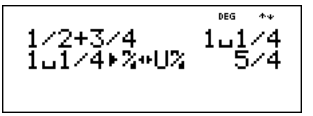
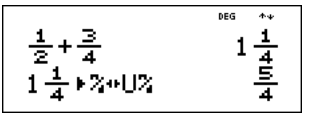
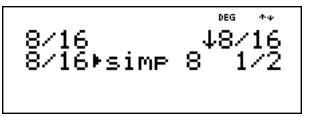
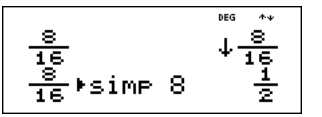
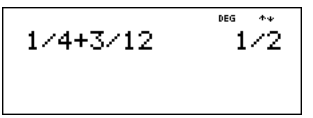
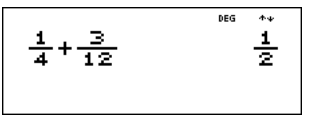
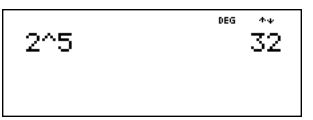
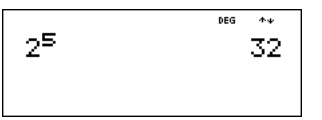
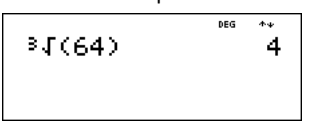
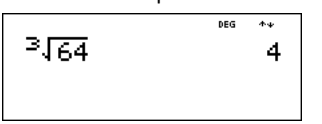
MANSIMP AUTOSIMP Determine whether or not a fractional result will be simplified automatically.

MANSIMP The user simplifies fractions manually step-by-step. ↓ next to the resulting fraction signifies that the fraction is not yet in simplest form. See Fractions, [▸simp] for details.

AUTOSIMP The calculator automatically simplifies fractional results to the lowest terms.

Example of Classic and MathPrint Modes

Classic mode	**MathPrint mode**
Sci SCI DEG 12345 1.2345×10^4	Sci SCI DEG 12345 1.2345×10^{4}
Float mode and answer toggle key. DEG 1/8 1/8 1/8 0.125	Float mode and answer toggle key. DEG $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ 0.125
Fix 2	Fix 2 and answer toggle key.

Classic mode	MathPrint mode
	
n/d Un/d	
	
Mansimp	
	
Autosimp	
	
Exponent example	Exponent example
	
Cube root example	Cube root example
	

Menus

Certain keys display menus: prb, 2nd [angle], 2nd [log], 2nd [trig], math, data data, 2nd [stat], 2nd [reset], 2nd [recall], and 2nd [clear var].

Press ⏷ and ⏵ to scroll and select a menu item, or press the corresponding number next to the menu item. To return to the previous screen without selecting the item, press clear. To exit a menu or application and return to the Home screen, press 2nd [quit].

The menu chart shows the menu keys and the menus they display.

prb		2nd [angle]	
PRB	**RAND**	**DMS**	**R ◂ ▸ P**
1: nPr 2: nCr 3: !	1: rand 2: randint(	1: ° 2: ′ 3: ″ 4: r 5: ▸ DMS	1: R ▸ Pr(2: R ▸ Pθ(3: P ▸ Rx(4: P ▸ Ry(

2nd [log]		2nd [trig]
LOG	**LN**	**TRIG**
1: log(2: 10^(	1: ln(2: e^(	1: sin(2: cos(3: tan(4: $\sin^{-1}$(5: $\cos^{-1}$(6: $\tan^{-1}$(

math	
MATH	**NUM**
1: lcm(2: gcd(3: ^{3} 4: $\sqrt[3]{}$(	1: abs(2: round(3: iPart(4: fPart(5: min(6: max(7: remainder(

data data

Press once to display the Data editor screen. Press again to display the menu.

CLEAR	**CNVRSN**
1: Clear L1	1: Add/Edit Cnvrs
2: Clear L2	2: Clear L1 Cnvrs
3: Clear L3	3: Clear L2 Cnvrs
4: Clear ALL	4: Clear L3 Cnvrs

CLEAR	CNVRSN
	5: Clear ALL

Press [data] while you are in the Add/Edit Conversion option of the CNVRSN menu to display this menu:

Ls
1: L1
2: L2
3: L3

[2nd] [stat]

STATS
1: 1-Var Stats
2: 2-Var Stats
3: StatVars*

* This menu option displays after you calculate 1-var or 2-var stats:

StatVars
1: n
2: $\bar{x}$
3: Sx
Etc. See Statistics values for a full list.

[2nd] [reset]	[2nd] [recall]	[2nd] [clear var]
Reset	**Recall Var**	**Clear Var**
1: No	1: x =	1: Yes
2: Yes	2: y =	2: No
	3: z =	
	4: t =	
	5: a =	
	6: b =	
	7: c =	

Scrolling

◀ ▶ ▲ ▼

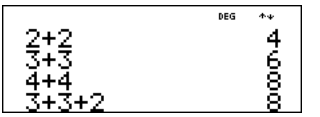
Press ◀ or ▶ to scroll entries on the Home screen and to navigate in menus. Press 2nd ◀ or 2nd ▶ to move the cursor directly to the beginning or end of the current expression.

▲ and ▼ moves the cursor up and down through menu items, entries in Data editor, and previous entries on the Home screen. You can reuse a previous entry by pressing enter to paste it on the bottom line, and then evaluating a new expression.

2nd ▲ moves the cursor to the top entry of the active column in Data editor, or to the previous entry on the Home screen. Press 2nd ▲ again to move the cursor to the oldest entry on the Home screen.

2nd ▼ moves the cursor to the first blank row of the active column in Data editor, or below the last entry on the Home screen.

Examples

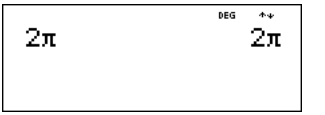
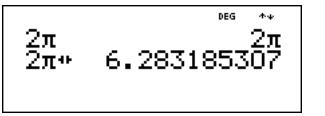
Scroll	**1** + **1** enter	
	2 + **2** enter	
	3 + **3** enter	
	4 + **4** enter	
	▲ ▲ ▲ ▲ enter	
	+ **2** enter	

Answer Toggle

◆▶

Press the ◆▶ key to toggle the display result between fraction and decimal answers, and exact pi and decimal.

Example

Answer toggle	**2** [π] [enter]	
	[◂▸]	

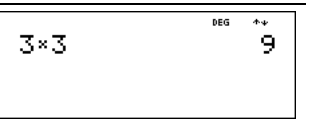
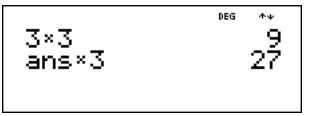
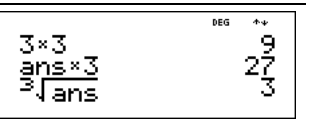
Last Answer

[2nd] [ans]

The most recently calculated result is stored to the variable **ans**. **ans** is retained in memory, even after the TI-34 MultiView™ calculator is turned off. To recall the value of **ans**:

- Press [2nd] [ans] (**ans** displays on the screen), or
- Press any operations key ([+], [−], and so forth) as the first part of an entry. **ans** and the operator are both displayed.

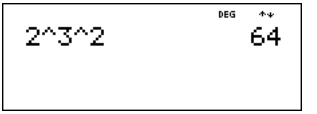
Examples

ans	**3** [×] **3** [enter]	
	[×] **3** [enter]	
	3 [2nd] [$x\sqrt{}$] [2nd] [ans] [enter]	

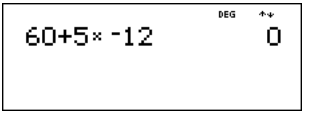
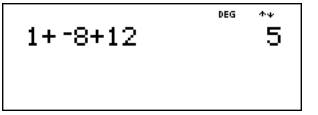
Order of Operations

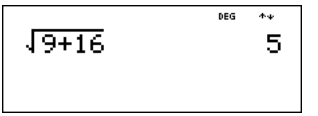
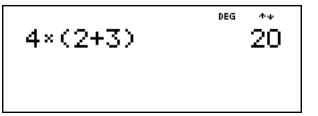
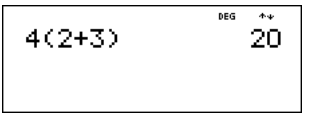
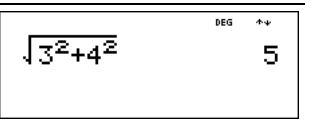
The TI-34 MultiView™ calculator uses Equation Operating System (EOS™) to evaluate expressions. Within a priority level, EOS evaluates functions from left to right and in the following order.

1st	Expressions inside parentheses.
2nd	Functions that need a **)** and precede the argument, such as **sin**, **log**, and all **R◂▸P** menu items.

3rd	Fractions.
4th	Functions that are entered after the argument, such as x^2 and angle unit modifiers.
5th	Exponentiation (^) and roots ($\sqrt[x]{}$). **Note**: In Classic mode, exponentiation using ^ is evaluated from left to right. The expression 2^3^2 is evaluated as (2^3)^2, with a result of 64.  In MathPrint™ mode, exponentiation using ^ is evaluated from right to left. The expression 2^3^2 is evaluated as 2^(3^2), with a result of 512.  The TI-34 MultiView™ calculator evaluates expressions entered with x^2 from left to right in both Classic and MathPrint modes.
6th	Negation (⁻).
7th	Permutations (**nPr**) and combinations (**nCr**).
8th	Multiplication, implied multiplication, division.
9th	Addition and subtraction.
10th	Conversions (**n/d▸Un/d**, **f▸d**, **▸DMS**).
11th	enter completes all operations and closes all open parentheses.

Examples

+ × ÷ ⁻	**60** + **5** × (−) **12** enter	
(⁻)	**1** + (−) **8** + **12** enter	

( )	√ 9 + 16 enter	
	4 × (2 + 3) enter	
	4 (2 + 3) enter	
^ and $\sqrt[x]{}$	√ 3 ^ 2 ▶ + 4 ^ 2 enter	

Clearing and Correcting

clear	Clears characters and error messages. Clears characters on the entry line, then clears the display when you press clear again. Scroll up to clear entries in history. Backs up one screen in applications.
delete	Deletes the character at the cursor.
2nd [insert]	Inserts a character at the cursor.
2nd [clear var]	Clears variables **x**, **y**, **z**, **t**, **a**, **b**, and **c**.
2nd [reset] **2**	Resets the TI-34 MultiView™ calculator. Returns unit to default settings; clears memory variables, pending operations, all entries in history, functions in applications, and statistical data; clears stored operations (**op1** or **op2**), and **ans**.

Math Operations

math

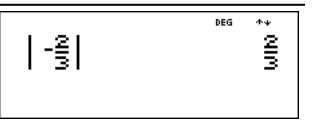
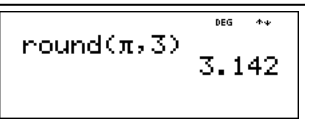
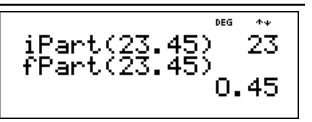
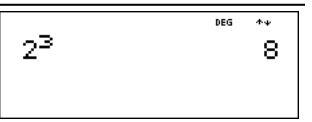
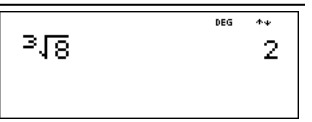
math displays a menu with two submenus. Some functions require you to enter 2 values, numbers, or expressions that equal or return a number. 2nd [,] separates two values.

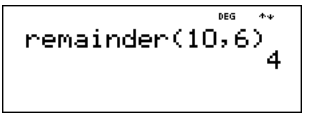
MATH submenu:	
lcm(n_1**,** n_2**)** **gcd(**n_1**,** n_2**)**	Finds the least common multiple (**lcm**) or greatest common divisor (**gcd**) of two values, n_1

	and n_2, which are positive integers.
n^3	Calculates the cube of *n*.
$\sqrt[3]{(}$*n*	Calculates the cube root of *n*.

NUM submenu:	
abs(*n***)**	Displays absolute value of *n*.
round(*n,digits***)**	Rounds *n* to specified number of *digits*.
iPart(*n***)** **fPart(***n***)**	Returns only the integer part (iPart) or fractional (decimal) part (fPart) of *n*.
min(n_1**,** n_2**)** **max(**n_1**,** n_2**)**	Returns the minimum **(min)** or maximum **(max)** of two values, n_1 and n_2.
remainder(n_1**,** n_2**)**	Returns the remainder resulting from the division of 2 values, n_1 by n_2.

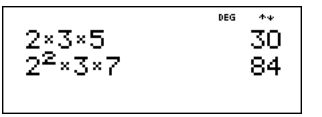
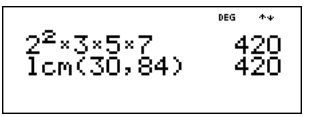
Examples

abs	math ▸ **1** (−) **2** $\frac{n}{d}$ **3** enter	
round	math ▸ **2** π 2nd [,] **3**) enter	
iPart, fPart	math ▸ **3** **23.45**) enter math ▸ **4** **23.45**) enter	
$\sqrt[3]{n}$, n^3	**2** math **3** enter	
	math **4** **8** enter	

remainder	math ▶ 7 10 2nd [,] 6) enter	

Problem

Find the least common multiple of 30 and 84 using prime factorization by hand. Verify your work using the calculator.

2 × 3 × 5 enter 2 x^2 × 3 × 7 enter	
2 x^2 × 3 × 5 × 7 enter math 1 30 2nd [,] 84) enter	

The lcm (30, 84) is 420.

Memory and Stored Variables

x^{yzt}_{abc} sto▸ 2nd [recall] 2nd [clear var]

The TI-34 MultiView™ calculator has 7 memory variables — **x**, **y**, **z**, **t**, **a**, **b**, and **c**. You can store a real number or an expression that results in a real number to a memory variable.

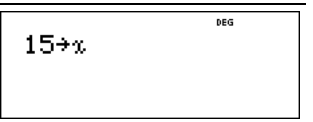
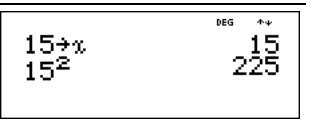
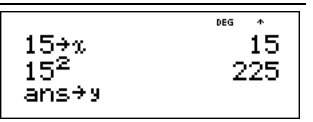
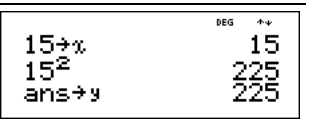
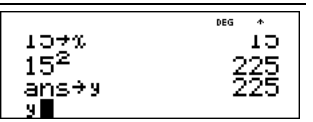
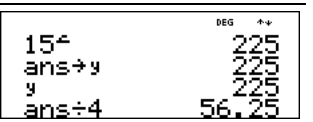
sto▸ lets you store values to variables. Press sto▸ to store a variable, and press x^{yzt}_{abc} to select the variable to store. Press enter to store the value in the selected variable. If this variable already has a value, that value is replaced by the new one.

x^{yzt}_{abc} accesses the variables. Press this key multiple times to choose **x**, **y**, **z**, **t**, **a**, **b**, or **c**. You can also use x^{yzt}_{abc} to recall the stored values for these variables. The name of the variable is inserted into the current entry, but the value assigned to the variable is used to evaluate the expression.

2nd [recall] recalls the values of variables. Press 2nd [recall] to display a menu of variables and their stored values. Select the variable you want to recall and press enter. The value assigned to the variable is inserted into the current entry and used to evaluate the expression.

2nd [clear var] clears all variable values. Press 2nd [clear var] and select **1: Yes** to clear all variable values.

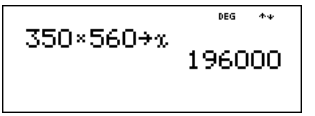
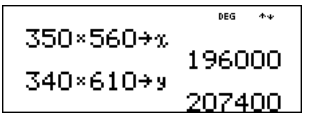
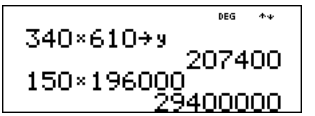
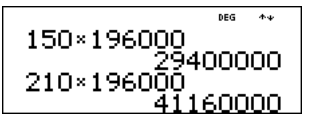
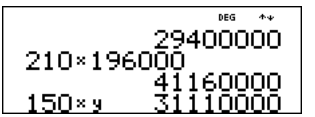
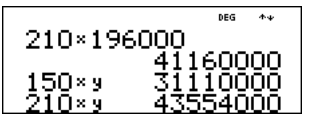
Examples

Clear Var	2nd [clear var] **1**	
Store	**15** sto▸ x^{yzt}_{abc}	
	enter	
Recall	2nd [recall]	
	enter x^2 enter	
	sto▸ x^{yzt}_{abc} x^{yzt}_{abc}	
	enter	
	x^{yzt}_{abc} x^{yzt}_{abc}	
	enter ÷ **4** enter	

Problem

In a gravel quarry, two new excavations have been opened. The first one measures 350 meters by 560 meters, the second one measures 340 meters by 610 meters. What

volume of gravel does the company need to extract from each excavation to reach a depth of 150 meters? To reach 210 meters?

350 × **560** sto▸ x^{yzt}_{abc} enter	
340 × **610** sto▸ x^{yzt}_{abc} x^{yzt}_{abc} enter	
150 × 2nd [recall]	
enter enter	
210 × 2nd [recall] enter enter	
150 × x^{yzt}_{abc} x^{yzt}_{abc} enter	
210 × x^{yzt}_{abc} x^{yzt}_{abc} enter	

For the first excavation: The company needs to extract 29.4 million cubic meters to reach a depth of 150 meters, and to extract 41.16 million cubic meters to reach a depth of 210 meters.

For the second excavation: The company needs to extract 31.11 million cubic meters to reach a depth of 150 meters, and to extract 43.554 million cubic meters to reach a depth of 210 meters.

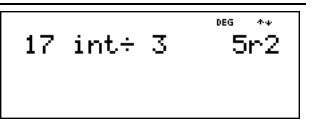
Math Functions

Integer Divide

2nd [int÷]

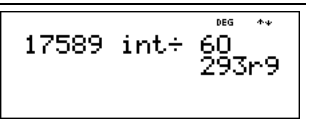
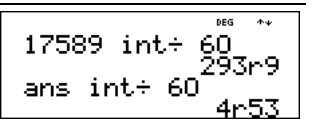
2nd [int÷] divides 2 positive integers and displays the quotient, **q**, and the remainder, **r**. Only the quotient is stored to **ans**.

Example

Int divide	**17** 2nd [int÷] **3** enter	

Problem

How many hours, minutes, and seconds are there in 17589 seconds?

17589 2nd [int÷] **60** enter	
2nd [ans] 2nd [int÷] **60** enter	

17589 seconds equals 4 hours, 53 minutes, and 9 seconds.

Fractions

[a/b] [U a/b] 2nd [a◂▸U a/b] ▸simp 2nd [f◂▸d]

In the MathPrint™ mode, fractions with [a/b] can include operation keys (+, ×, etc.) and most function keys (x^2, %, etc.).

In Classic mode, fractions with [a/b] do not allow operation keys, functions, or complex fractions in the numerator or denominator.

Note: In Classic mode and Data editor, use ÷ to perform complex division problems.

Calculations using fractions can display fraction or decimal results, depending on input.

- [a/b] enters a simple fraction. Pressing [a/b] before or after a number can result in different behavior. Entering a number before pressing [a/b] makes that number the numerator.

  To enter fractions with operators, press [a/b] before you enter a number (in MathPrint mode only).

In MathPrint mode, press ⊛ between the entry of the numerator and the denominator.

In Classic mode, press [n/d] between the entry of the numerator and the denominator.

- [Un/d] enters a mixed number. Press [Un/d] between the entry of the unit and the numerator, and press ⊛ between the entry of the numerator and the denominator.
- [▸simp] *n* [enter] simplifies a fraction by the factor *n* specified The entry *n* must be a positive integer.
- [▸simp] [enter] automatically simplifies a fraction using the lowest common prime factor. The factor displays. Repeatedly press [▸simp] [enter] to simplify the fraction to its lowest terms.
- [2nd] [n/d◂▸Un/d] converts between simple fraction and mixed number form.
- [2nd] [f◂▸d] converts results between fractions and decimals.

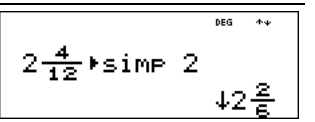
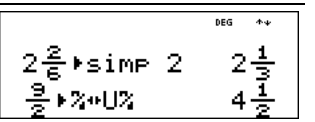
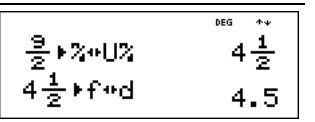
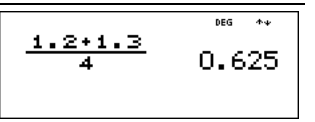
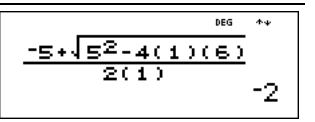
From [mode], you can select

- **ManSimp** (default) The user simplifies fractions manually step-by-step. ↓ next to the resulting fraction signifies that the fraction is not yet in simplest form.
- **AutoSimp** The calculator automatically simplifies fractional results to the lowest terms.

Examples of Classic mode

n/d, Un/d	**3** [n/d] **4** [+] **1** [Un/d] **7** [n/d] **12** [enter]	DEG 3/4+1⌴7/12 ↓2⌴4/12
Simp	[▸simp] **2** [enter]	DEG 3/4+1⌴7/12 ↓2⌴4/12 2⌴4/12▸simp 2 ↓2⌴2/6
	[▸simp] **2** [enter]	DEG 2⌴4/12▸simp 2 ↓2⌴2/6 2⌴2/6▸simp 2 2⌴1/3
n/d ◂▸Un/d	**9** [n/d] **2** [2nd] [n/d◂▸Un/d] [enter]	DEG ↓2⌴2/6 2⌴2/6▸simp 2 2⌴1/3 9/2▸%◂▸U% 4⌴1/2
f◂▸d	**4** [Un/d] **1** [n/d] **2** [2nd] [f◂▸d] [enter]	DEG 2⌴2/6▸simp 2 2⌴1/3 9/2▸%◂▸U% 4⌴1/2 4⌴1/2▸f◂▸d 4.5

Examples of MathPrint™ mode

n/d, Un/d	[n/d] 3 ▼ 4 ▶ + 1 [Un/d] 7 ▼ 12 enter	
Simp	▶simp 2 enter	
	▶simp 2 enter	
n/d◀▶Un/d	9 [n/d] 2 ▶ [n/d◀▶Un/d] enter	
f◀▶d	4 [Un/d] 1 ▼ 2 ▶ 2nd [f◀▶d] enter	
Examples (MathPrint™ mode only)	[n/d] 1.2 + 1.3 ▼ 4 ▶ enter	
(MathPrint™ mode only)	[n/d] (−) 5 + √ 5 [x²] − 4 (1) (6) ▼ 2 (1) ▶ enter	

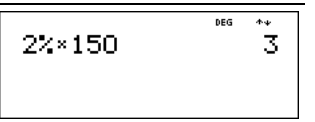
Percentages

% 2nd [▶%]

To perform a calculation involving a percentage, enter a number and press % to append the % sign.

To express a value as a percentage, press 2nd [▶%] after the value.

Example

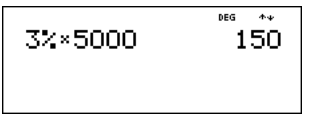
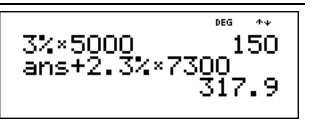
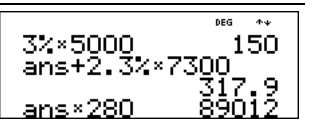
2 % × 150 enter	

1 $\frac{n}{d}$ **5** ▶ **2nd** [▸%] **enter**	

Problem

A mining company extracts 5000 tons of ore with a concentration of metal of 3%, and 7300 tons with a concentration of 2.3%. On the basis of these two extraction figures, what is the total quantity of metal obtained?

If one ton of metal is worth $280, what is the total value of the metal extracted?

3 **%** × **5000** **enter**	
+ **2.3** **%** × **7300** **enter**	
× **280** **enter**	

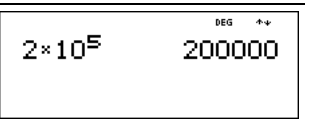
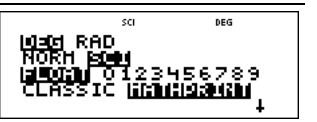
The two extractions represent a total of 317.9 tons of metal for a total value of $89,012.

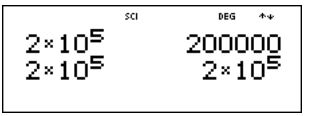
x10^n Key

[×10^n]

[×10^n] is a shortcut key to enter a number in scientific notation format.

Example

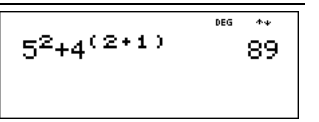
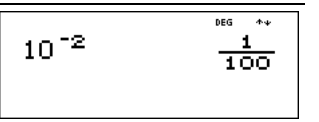
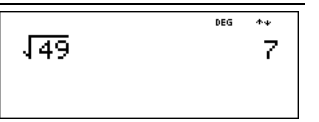
2 [×10^n] **5** **enter**	
mode ▼ ▶ **enter**	

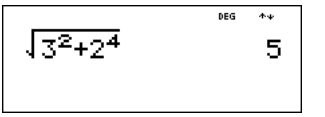
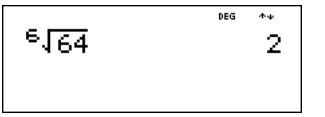
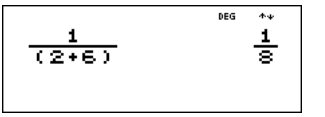
clear enter	

Powers, Radicals, and Reciprocals

x^2	Calculates the square of a value. The TI-34 MultiView™ calculator evaluates expressions entered with x^2 from left to right in both Classic and MathPrint™ modes. Pressing **3** x^2 x^2 calculates as $(3^2)^2 = 81$.
^	Raises a value to the power indicated. If you insert an expression as the exponent, you must place it between parentheses. In Classic mode, exponentiation using ^ is evaluated from left to right. The expression 2^3^2 is evaluated as (2^3)^2, with a result of 64. In MathPrint™ mode, exponentiation using ^ is evaluated from right to left. The expression 2^3^2 is evaluated as 2^(3^2), with the result of 512.
√	Calculates the square root of a positive value.
2nd [$\sqrt[x]{}$]	Calculates the *x*th root of any positive value and any odd integer root of a negative value.
2nd [$1/x$]	Calculates the reciprocal of a value.

Examples

5 x^2 + **4** ^ (**2** + **1**) enter	
10 ^ (−) **2** enter	
√ **49** enter	

√ **3** x^2 + **2** ^ **4** enter	
6 2nd [x√] **64** enter	
(**2** + **6**) 2nd [$1/x$] enter	

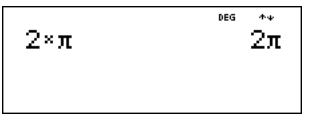
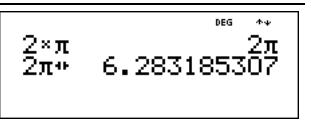
Pi

π

π ≈ 3.141592653590 for calculations.

π ≈ 3.141592654 for display.

Example

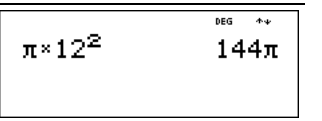
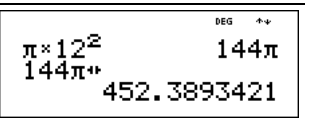
π	**2** × π enter	
	◄►	

Note: Classic mode displays calculations with π as a decimal approximation.

Problem

What is the area of a circle if the radius is 12 cm?

Reminder: $A = \pi r^2$.

π × **12** ^ **2** enter	
◄►	

The area of the circle is 144 π square cm. The area of the circle is approximately 452.4 square cm when rounded to one decimal place.

Angle Menu

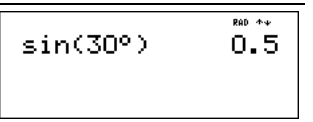
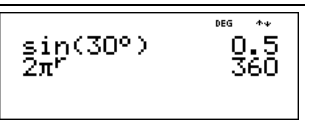
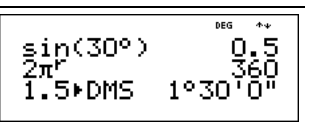
2nd [angle]

2nd [angle] displays the choice of two submenus that enable you to specify the angle unit modifier as degrees (°), minutes ('), seconds ("), radian (r), or convert units using ▶**DMS**. You can also convert between rectangular coordinate form (R) and polar coordinate form (P).

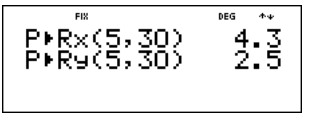
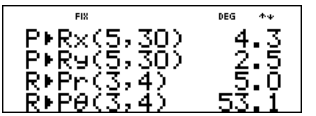
Choose an angle mode from the mode screen. You can choose from DEG (default) or RAD. Entries are interpreted and results displayed according to the angle mode setting without needing to enter an angle unit modifier.

If you specify an angle unit modifier from the Angle menu, the calculation is performed in that angle type, but the result will be given in the angle mode setting.

Examples

RAD	mode ▶ enter	
	clear 2nd [trig] **1** **30** 2nd [angle] **1**) enter	
DEG	mode enter	
° ′ ″	clear **2** π 2nd [angle] **4** enter	
▶DMS	**1.5** 2nd [angle] **5** enter	

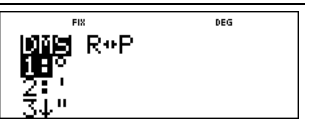
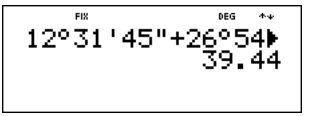
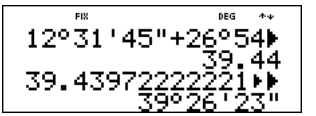
Convert polar coordinates (r,θ)=(5,30) into rectangular coordinates. Then convert rectangular coordinates (x,y) = (3,4) into polar coordinates. Round the results to one decimal place.

R▸P	clear mode ▼ ▼ ▶ ▶ enter	
	clear 2nd [angle] ▶ **3** **5** 2nd [,] **30**) enter 2nd [angle] ▶ **4** **5** 2nd [,] **30**) enter	
	2nd [angle] ▶ **1** **3** 2nd [,] **4**) enter 2nd [angle] ▶ **2** **3** 2nd [,] **4**) enter	

Converting (r,θ) = (5,30) gives (x,y) = (4.3,2.5) and converting (x,y) = (3,4) gives (r,θ) = (5.0,53.1).

Problem

Two adjacent angles measure 12° 31′ 45″ and 26° 54′ 38 ″ respectively. Add the two angles and display the result in DMS format. Round the results to two decimal places.

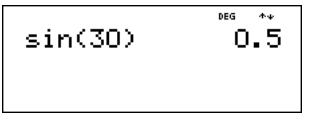
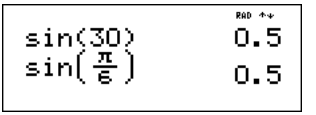
clear mode ▼ ▼ ▶ ▶ ▶ enter	
clear **12** 2nd [angle]	
1 **31** 2nd [angle] **2** **45** 2nd [angle] **3** + **26** 2nd [angle] **1** **54** 2nd [angle] **2** **38** 2nd [angle] **3** enter	
2nd [angle] **5** enter	

The result is 39 degrees, 26 minutes and 23 seconds.

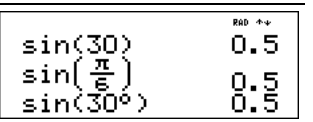
Problem

It is known that 30° = π / 6 radians. In the default mode, degrees, find the sine of 30°. Then set the calculator to radian mode and calculate the sine of π / 6 radians.

Note: Press clear to clear the screen between problems.

clear 2nd [trig] **1** **30**) enter	
mode ▶ enter clear 2nd [trig] **1** π ⁿ/d **6** ▶) enter	

Retain radian mode on the calculator and calculate the sine of 30°. Change the calculator to degree mode and find the sine of π / 6 radians.

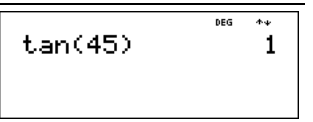
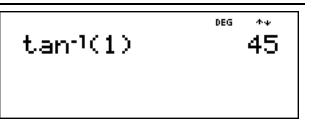
2nd [trig] **1** **30** 2nd [angle] enter) enter	
mode enter clear 2nd [trig] **1** π ⁿ/d **6** ▶ 2nd [angle] **4**) enter	

Trigonometry

2nd [trig]

2nd [trig] displays a menu of all supported trigonometric functions (sin, cos, tan, $\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$). Select the trigonometric function from the menu and then enter the value. Set the desired Angle mode before starting trigonometric calculations.

Example Degree mode

Tan	mode enter ▼ ▼ enter clear 2nd [trig] **3** **45**) enter	
$\tan^{-1}$	2nd [trig] **6** **1**) enter	

Cos	**5** × 2nd [trig] **2** **60**) enter	5×cos(60) 2.5

Example Radian mode

Tan	mode ▶ enter clear 2nd [trig] **3** π ⁿ/d **4** ▶) enter	tan(π/4) 1
Tan^{-1}	2nd [trig] **6** **1**) enter	tan⁻¹(1) 0.785398163
	◀▶	0.785398163 0.7853981633975 π/4
Cos	**5** × 2nd [trig] **2** π ⁿ/d **4** ▶) enter	5×cos(π/4) 3.535533906

Problem

Find angle A of the right triangle below. Then calculate angle B and the length of the hypotenuse c. Lengths are in meters. Round results to one decimal place.

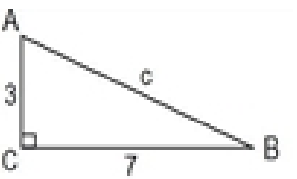
Reminder:

tan A = $\frac{7}{3}$ therefore $m\angle A = \tan^{-1}\left(\frac{7}{3}\right)$

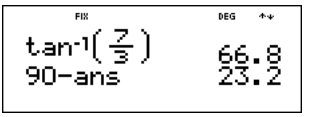
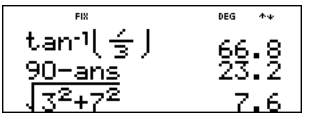
$m\angle A + m\angle B + 90° = 180°$

therefore $m\angle B = 90° - m\angle A$

$c = \sqrt{3^2 + 7^2}$



mode enter ▼ ▼ ▶ ▶ enter clear 2nd [trig] **6** **7** ⁿ/d **3** ▶) enter	FIX DEG tan⁻¹(7/3) 66.8

90 − 2nd [ans] enter	
√ **3** x^2 + **7** x^2 enter	

To one decimal place, the measure of angle A is 66.8°, the measure of angle B is 23.2°, and the length of the hypotenuse is 7.6 meters.

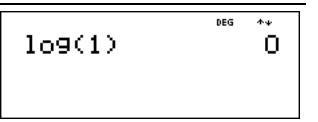
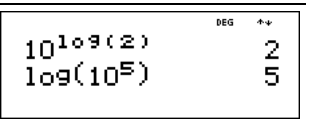
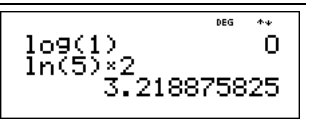
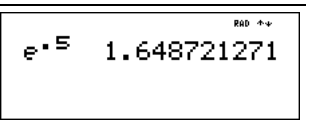
Logarithms and Exponential Functions

2nd [log]

2nd [log] displays two submenus containing the functions **log**, **10^**, **ln**, and **e^**. Select the submenu, the desired log function, then enter the value and close the expression with) enter.

- **log** yields the common logarithm of a number.
- **10^** raises 10 to the power you specify.
- **ln** yields the logarithm of a number to the base of e ($e \approx 2.718281828459$).
- **e^** raises e to the power you specify.

Examples

LOG	2nd [log] **1** **1**) enter	
10^	2nd [log] **2** 2nd [log] **1** **2**) enter 2nd [log] **1** 2nd [log] **2** **5** ▶) enter	
LN	2nd [log] ▶ **1** **5**) × **2** enter	
e^	2nd [log] ▶ **2** **.5** enter	

Statistics

2nd [stat] data

2nd [stat] displays a menu with the following options:

- **1-Var Stats** analyzes data from 1 data set with 1 measured variable, *x*.
- **2-Var Stats** analyzes paired data from 2 data sets with 2 measured variables—*x*, the independent variable, and *y*, the dependent variable.
- **StatVars** displays a secondary menu of statistical variables. The StatVars menu only appears after you have calculated 1-Var or 2-Var stats. Use ⊖ and ⊕ to locate the desired variable, and press enter to select it.

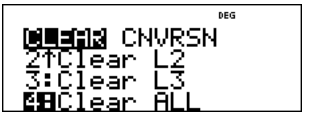
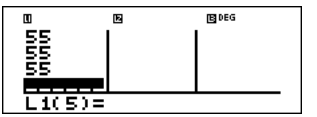
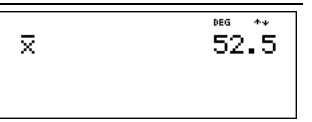
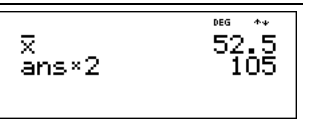
Variables	Definition
n	Number of *x* or (*x*,*y*) data points.
$\bar{x}$ or $\bar{y}$	Mean of all *x* or *y* values.
Sx or **Sy**	Sample standard deviation of *x* or *y*.
σx or σy	Population standard deviation of *x* or *y*.
Σx or Σy	Sum of all *x* or *y* values.
Σx^2 or Σy^2	Sum of all x^2 or y^2 values.
Σxy	Sum of (*x*...*y*) for all *xy* pairs.
a	Linear regression slope.
b	Linear regression *y*-intercept.
r	Correlation coefficient.
x' (**2-Var**)	Uses *a* and *b* to calculate predicted *x* value when you input a *y* value.
y' (**2-Var**)	Uses *a* and *b* to calculate predicted *y* value when you input an *x* value.

To define statistical data points:

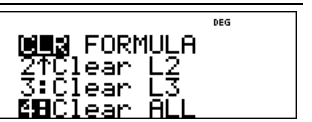
1. Enter data in L1, L2, or L3. (See Data Editor and List Conversions.)
2. Press 2nd [stat]. Select **1-Var** or **2-Var** and press enter.
3. Select L1, L2, or L3, and the frequency.
4. Press enter to display the menu of variables.
5. To clear data, press data data, select a list to clear, and press enter.

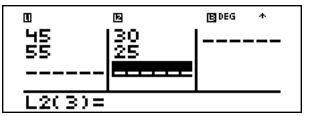
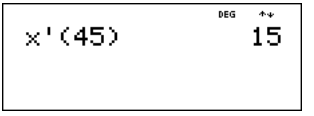
Examples

1-Var: Find the mean of {45,55,55,55}

Clear all data	data data ⊙ ⊙ ⊙	
Data	enter **45** ⊙ **55** ⊙ **55** ⊙ **55** enter	
Stat	2nd [stat]	
	1 ⊙ ⊙	
	enter	
Stat Var	2nd [quit] 2nd [stat] **3**	
	2 enter	
	× **2** enter	

2-Var: Data: (45,30), (55,25); Find: x '(45)

Clear all data	data data ⊙ ⊙ ⊙	

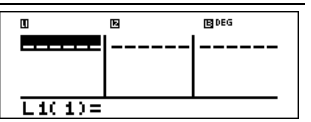
Data	enter **45** ▼ **55** ▼ ▶ **30** ▼ **25** ▼	
Stat	2nd [stat] (Your screen may not show **3:StatVars** if you did not previously perform a calculation.)	
	2 ▼ ▼	
	enter	
	2nd [quit] 2nd [stat] **3** ▲ ▲	
	enter **45**) enter	

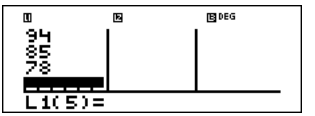
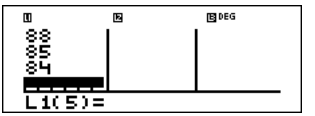
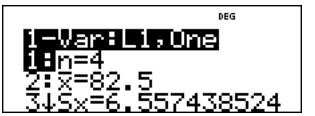
Problem

For her last four exams, Ada earned the following scores.

Test No.	1	2	3	4
Score	73	94	85	78

1. Find Ada's average grade on the four exams.
2. Ada found an error in the two of her test scores. Test 2 was changed to 88 and Test 4 was changed to 84. Find Ada's new average grade of the four exams.
3. What do you notice about Ada's average grades before the point change and after the point change?

Clear all data	data [data] **4**	

Data	**73** ▼ **94** ▼ **85** ▼ **78** ▼	
	2nd [stat]	
	1 ▼ ▼ enter The average grade is 82.5.	
	data ▼ **88** ▼ ▼ **84** ▼	
	2nd [stat] **1**	
	▼ ▼ enter The new average grade is 82.5.	

Ada's average did not change. It remained 82.5 after the grade corrections.

The reason the average did not change is that Test 2 had a decrease of 6 points while Test 4 had an increase of 6 points. Overall, the total points for all four tests remained the same (330 points).

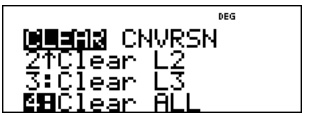
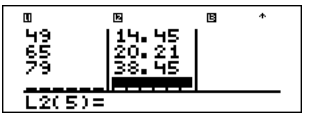
Problem

The table below gives the results of a braking test.

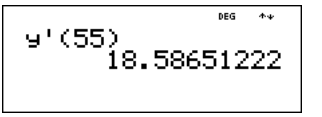
Test No.	1	2	3	4
Speed (kph)	33	49	65	79
Distance (m)	5.30	14.45	20.21	38.45

Using the relationship between these data points, estimate the stopping distance required for a vehicle traveling at 55 kph.

A hand-drawn scatter plot of these data points suggest a linear relationship. The TI-34 MultiView™ calculator uses the least squares method to find the line of best fit, $y'=ax'+b$, for data entered in lists.

data data **4**	
33 ⊙ **49** ⊙ **65** ⊙ **79** ⊙ ⊙ **5.3** ⊙ **14.45** ⊙ **20.21** ⊙ **38.45** ⊙	
2nd [stat]	
2 ⊙ ⊙	
enter	
Press ⊙ to view a and b.	

This line of best fit, y ' = 0.6773251896x '-18.66637321 models the linear trend of the data.

2nd [quit] 2nd [stat] **3** ⊙	
enter **55**) enter	

The linear model gives an estimated braking distance of 18.59 meters for a vehicle traveling at 55 kph.

Probability

prb

This key displays two menus: **PRB** and **RAND**.

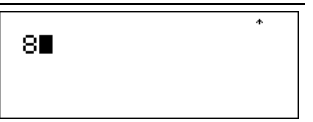
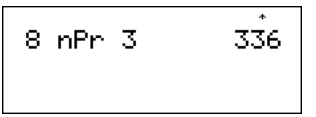
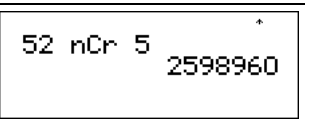
PRB contains the following options:

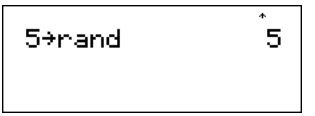
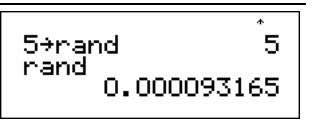
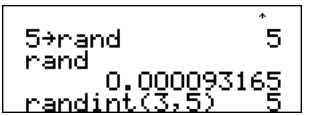
nPr	Calculates the number of possible **permutations** of n items taken r at a time, given n and r. The order of objects is important, as in a race. n and r must be positive integers.
nCr	Calculates the number of possible **combinations** of n items taken r at a time, given n and r. The order of objects is not important, as in a hand of cards. n and r must be positive integers.
!	A **factorial** is the product of the positive integers from 1 to n. n must be a whole number ≤ 69.

RAND contains the following options:

rand	Generates a random real number between 0 and 1. To control a sequence of random numbers, store an integer (seed value) ≥ 0 to **rand**. The seed value changes randomly every time a random number is generated.
randint(	Generates a random integer between 2 integers, A and B, where $A \le$ **randint** $\le B$. Separate the 2 integers with a comma.

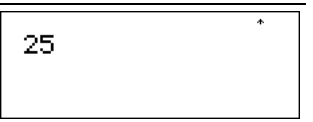
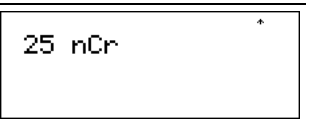
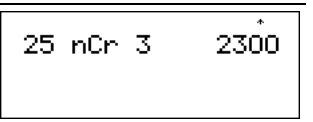
Examples

nPr	**8**	
	prb	
	enter **3** enter	
nCr	**52** prb **25** enter	

!	**4** prb **3** enter	
STO ▶ rand	**5** sto▶ prb ▶	
	1 enter	
rand	prb ▶ **1** enter	
randint(	prb ▶ **2** **3** 2nd [,] **5**) enter	

Problem

An ice cream store advertises that it makes 25 flavors of home made ice cream. You like to order three different flavors in a dish. How many combinations of ice cream can you test out over a very hot summer?

25	
prb **2**	
3 enter	

You can choose from 2300 dishes with different combinations of flavors! If a long hot summer is about 90 days long, you will need to eat about 25 ice cream dishes each day!

Math Tools

Data Editor and List Conversions

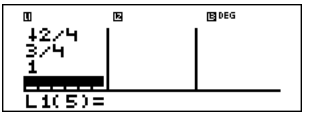
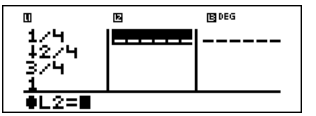
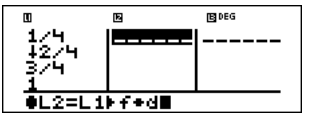
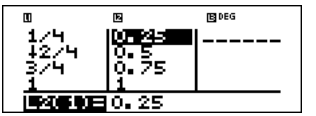
data

data lets you enter data in up to 3 lists. Each list can contain up to 42 items. Press 2nd ▲ to go to the top of a list, and 2nd ▼ to go to the bottom of a list.

List conversions accept f◂▸d, ▸%, ▸Simp, and n/d◂▸Un/d.

Numeric notation, decimal notation, and angle modes affect the display of an element (except fractional elements).

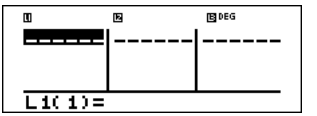
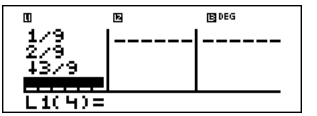
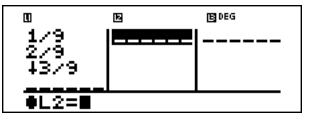
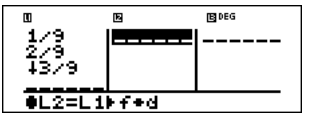
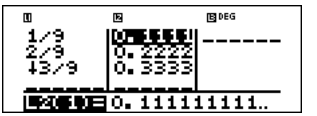
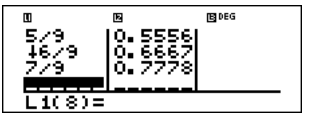
Example

L1	data 1 a/b 4 ▼ 2 a/b 4 ▼ 3 a/b 4 ▼ 4 a/b 4 enter	
Conversion	▶ data ▶	
	enter	
	data enter 2nd [f◂▸d]	
	enter	

Notice L2 is calculated per the conversion you entered, and L2(1)= in the author line is highlighted to indicate the list is the result of a conversion.

Problem

Find the decimal representation of $\frac{1}{9}$, $\frac{2}{9}$, and $\frac{3}{9}$. From this pattern, can you predict the decimal representation for $\frac{7}{9}$? Check your answer using the lists on the calculator.

data data **4** data ▶ **5**	
1 ▫/▫ **9** ▼ **2** ▫/▫ **9** ▼ **3** ▫/▫ **9** enter	
▶ data ▶ **1**	
data **1** 2nd [f◂▸d]	
enter	
Input the rest of the fractions to test your pattern. Notice L2 updates as you enter in L1.	

The pattern appears to show that the decimal representation is a repetition of the number in the numerator for ninths. Entering $\frac{4}{9}$, $\frac{5}{9}$, $\frac{6}{9}$ and finally $\frac{7}{9}$ validates that statement. Notice the last digit in the list is rounded, so 0.777777… is shown rounded to 0.77778.

Stored Operations (op)

[op1] [op2] [2nd] [set op1] [2nd] [set op2]

The TI-34 MultiView™ calculator stores two operations, **op1** and **op2**. To store an operation to **op1** or **op2** and recall it:

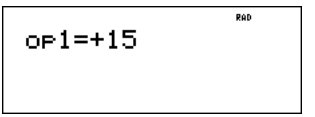
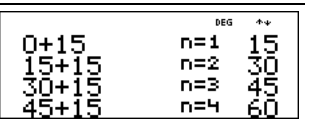
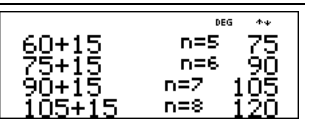
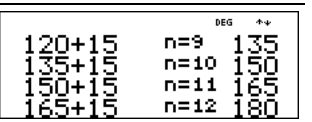
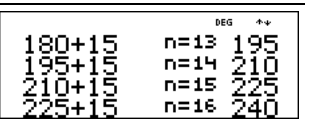
1. Press [2nd] [set op1] or [2nd] [set op2]. You may have to press [clear] if a previous operation is displayed.
2. Enter the operation (any combination of numbers, operations, or menu items and their arguments).
3. Press [enter] to save the operation to memory.
4. [op1] or [op2] recalls and displays the operation on the entry line. The TI-34 MultiView™ calculator automatically calculates the result (without pressing [enter]).

Examples

Set op1	[2nd] [set op1] [×] **2** [+] **3** [enter]	RAD op1=×2+3
op1	**4** [op1]	DEG ↑↓ 4×2+3 n=1 11
	6 [op1]	DEG ↑↓ 4×2+3 n=1 11 6×2+3 n=1 15
Set op2	[2nd] [set op2] [×] **10** [enter]	RAD op2=×10
op2	**1** [op2]	DEG ↑↓ 1×10 n=1 10
	[op2]	DEG ↑↓ 1×10 n=1 10 10×10 n=2 100
	[op2]	DEG ↑↓ 1×10 n=1 10 10×10 n=2 100 100×10 n=3 1000

Problem

Harry's father will pay him $15 per week if he helps out a few hours at his family's grocery store. Harry would like to save all he earns to buy several of his favorite books and video games. He estimates that he will need to earn $240 to buy everything he would like to have. Create a table of Harry's weekly earnings to see how his savings will grow. How many weeks will Harry need to work to save enough money for his purchases?

2nd [set op1] (Press clear if necessary to clear a previous operation) + **15** enter	
0 op1 op1 op1 op1	
op1 op1 op1 op1	
op1 op1 op1 op1	
op1 op1 op1 op1	

The table of values of Harry's weekly earnings is shown on the screens. From this table, we can read that Harry will have to work 16 weeks to earn $240.

Reference Information

Errors

When the TI-34 MultiView™ calculator detects an error, it returns an error message with the type of error.

To correct the error, note the error type and determine the cause of the error. If you cannot recognize the error, use the following list, which describes error messages in detail.

Press [clear] to clear the error message. The previous screen is displayed with the cursor at or near the error location. Correct the expression.

ARGUMENT — A function does not have the correct number of arguments.

DIVIDE BY 0 — You attempted to divide by 0.

DOMAIN — You specified an argument to a function outside the valid range. For example:

- For $x\sqrt{}y$: $x = 0$ or ($y < 0$ and x is not an odd integer).
- For $\sqrt{}x$: $x < 0$.
- For **LOG** or **LN**: $x \leq 0$.
- For **tan**: $x = 90°, -90°, 270°, -270°, 450°$, etc., and equivalent for radian mode.
- For $\mathbf{sin}^{-1}$ or $\mathbf{cos}^{-1}$: $|x| > 1$.
- For **nCr** or **nPr**: n or r are not integers ≥ 0.
- For [▸simp]: Entering a simplify value of 0; using a simplify value of $\geq$ 1**E**10; attempting to simplify non-fractions.

EQUATION LENGTH — An entry exceeds the digit limits (88 for entry line and 47 for stat entries or constant entries); for example, combining an entry with a constant that exceeds the limit.

FRQ DOMAIN — FRQ value (in 1-var statistics) < 0.

OVERFLOW — You attempted to enter, or you have calculated, a number that is beyond the range of the calculator.

STAT — Attempting to calculate 1-var or 2-var stats with no defined data points, or attempting to calculate 2-var stats when the data lists are not of equal length.

CONVERSION

- The conversion does not contain a list name (L1, L2, or L3) followed by a conversion (for example, f◂▸d).
- You attempted to enter a function (for example, L1 + 3).

SYNTAX — The command contains a syntax error, or has misplaced functions, arguments, parentheses, or commas. If using [a b/c], try using [÷].

OP NOT DEFINED — Operation (**op1** or **op2**) is not defined.

MEMORY LIMIT

- The calculation contains too many pending operations (more than 23).
- If using **op1** or **op2**, you attempted to enter more than four levels of nested functions using fractions, square roots, exponents with ^, $x\sqrt{}$, and x^2 (MathPrint™ mode only).

LOW BATTERY — Replace the battery

Note: This message displays briefly and then disappears. Pressing clear does not clear this message.

Battery Information

Battery Caution:

- Do not ingest battery, Chemical Burn Hazard.
- This product contains a coin or button cell battery. If the coin or button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.
- Keep new and used batteries away from children.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.
- If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.
- Call a local poison control center for treatment information.
- Even used batteries may cause severe injury or death.
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above 140F (60C) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc or rechargeable batteries.
- Risk of fire or explosion if battery is replaced by an incorrect type.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations. Do NOT dispose of batteries in household trash or incinerate.

How to remove or replace the battery

The TI-34 MultiView™ calculator uses one 3 volt CR2032 lithium battery.

Remove the protective cover and turn the TI-34 MultiView calculator face downwards.

- With a small screwdriver, remove the screws from the back of the case.

- From the bottom, carefully separate the front from the back. **Be careful** not to damage any of the internal parts.
- With a small screwdriver (if required), remove the battery.
- To replace the battery, check the polarity (+ and -) and slide in a new battery. Press firmly to snap the new battery into place.

Important: When replacing the battery, avoid any contact with the other components of the TI-34 MultiView calculator.

Dispose of the dead battery immediately and in accordance with local regulations.

In Case of Difficulty

Review instructions to be certain calculations were performed properly.

Check the battery to ensure that it is fresh and properly installed.

Change the battery when:

- [on] does not turn the unit on, or
- The screen goes blank, or
- You get unexpected results.

General Information

Online Help

education.ti.com/eguide

Select your country for more product information.

Contact TI Support

education.ti.com/ti-cares

Select your country for technical and other support resources.

Service and Warranty Information

education.ti.com/warranty

Select your country for information about the length and terms of the warranty or about product service.

Limited Warranty. This warranty does not affect your statutory rights.

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