Run Menu

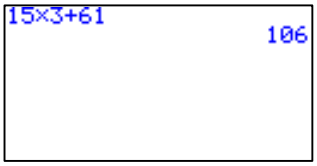
With manual calculations, input formulas from left to right, just as they are written on paper. With formulas that include mixed arithmetic operators and parentheses, the calculator automatically applies true algebraic logic to calculate the result.

Order of Operations

Example:

1. 15 x 3 + 61

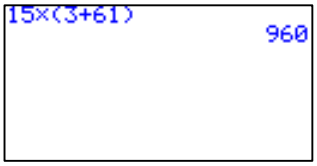
Enter the expression as it appears and press **[EXE]**



To edit an equation, there are two options.

- Using the **[◀]** will recall ONLY the last line entered, OR
- Pressing **[AC/ON]** followed by the **[▲]** will recall lines previously entered. Note: this is not an infinite listing.
- Press **[SHIFT] [DEL]** to insert characters.

2. 15 x (3 + 61)

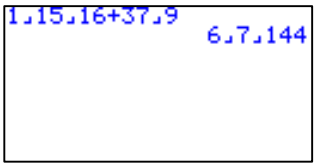


Fractions

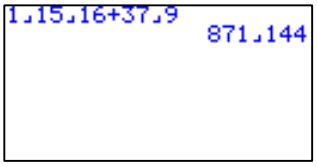
Example:

3. $1\frac{15}{16} + \frac{37}{9}$

Press 1 **[$a^b/_c$]**
15 **[$a^b/_c$]**
16 **[+]**
37 **[$a^b/_c$]**
9 **[EXE]**



Press **[SHIFT] [$a^b/_c$]** to convert it to a common fraction.



Press **[F↔D]** to toggle between fraction and its decimal equivalent.

Note: All fraction answers will be given in simplest mixed number form.

Notes:

Storing Values

Example:

4. Store the value 4 into the variable A.

4 **[→]**
[ALPHA]
[x,θ,T]
[EXE]

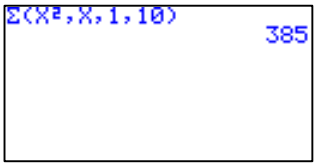
5. Is c = 5 a solution to 4c = 16?

4 **[→]**
[ALPHA] [ln]
[SHIFT] [VARS] [F6] [F5]
4 **[ALPHA] [ln]**
[SHIFT] [.] 16

Summation

Example:

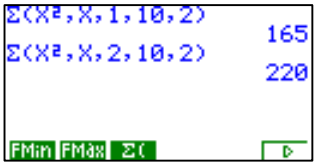
6. Find the sum of the squares from 1 to 10.



Press **[OPTN]**	Enter **[x,θ,T]**	
[F4]	**[x^2] [,]**	"x^2" is the expression
[F6]	**[x,θ,T] [,]**	"x" is the variable used by the expression
[F3]	1 **[,]**	"1" is the initial term of the sequence
	10 **[ )]** and **[EXE]**	"10" is the last term of the sequence

7. Find the sum of every other square from 1 to 10.

Press **[◄] [◄] [,]** 2 **[ )]** and **[EXE]**.
This will compute the sum of the squares of 1, 3, 5, 7 and 9.



8. Find the sum of every other square from 1 to 10 beginning with 2.

Press **[◄]** until the "1" is selected and type 2 and **[EXE]**.
This will compute the sum of the squares of 2, 4, 6, 8 and 10.

Notes:

Complex Numbers

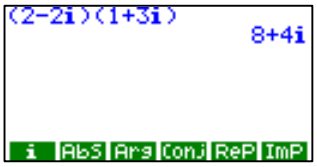
Example:

9. Find $\sqrt{-25}$

Press **[SHIFT] [x^2]** -25 and **[EXE]**. This shows the principle square root.

10. Find $(2 - 2i)(1 + 3i)$.

To get the "**i**", press **[OPTN] [F3] [F1]**

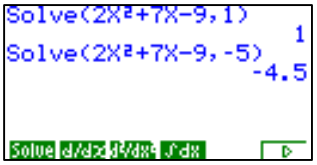


Numerical Calculations

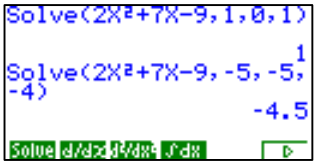
Example:

11. Solve $2x^2 + 7x - 9 = 0$

One option for solving this equation is from the **RUN** menu.
Press **[OPTN]**
[F4]
[F1]
Enter the quadratic expression **[,]**
an estimated solution **[,]**
the upper and lower bounds (optional)
[EXE]



Without bounds

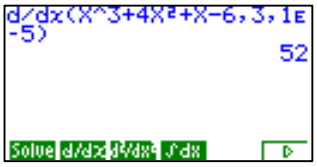


With bounds

Differential Calculations

12. Find the derivative at the point x = 3 for the function $y = x^3 + 4x^2 + x - 6$, when the increase/decrease of x is defined as $\Delta x = 1\text{E} - 5$.

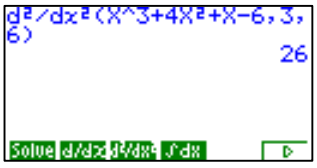
Press **[OPTN]**	Enter the equation **[,]**
[F4]	the point for which the derivative is to be determined **[,]**
[F2]	the increase/decrease of x **[ )]**
	[EXE]



Quadratic Differential Calculations

13. Find the quadratic differential coefficient at the point where x = 3 for the function $y = x^3 + 4x^2 + x - 6$ using a final boundary value of n = 6.

Press **[OPTN]**	Enter the equation **[,]**
[F4]	the differential coefficient point **[,]**
[F3]	the final boundary **[ )]**
	[EXE]

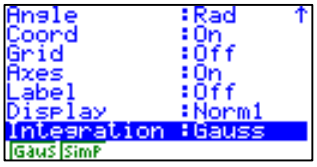


Integral Calculations

14. Find the integral calculation for the function $\int_1^5 (2x^2 + 3x + 4)dx$ with a tolerance of "tol" = 1E –4.

Press **[OPTN]**
[F4]
[F4]
Enter the expression **[,]**
the start and end points **[,]**
(9850 *Plus* only) the tolerance (Gauss-Kronrod Rule) or number of divisions (Simpson's Rule) **[ )]**
(The Gauss-Kronrod Rule is used for this example)
[EXE]

NOTE:
press **[SHIFT]**
[MENU]
scroll down to **Integration**
press **[F1]** or **[F2]** to select the rule for integration.



Notes:

Graph Menu

This calculator is capable of drawing the following types of graphs:

- Rectangular coordinate (Y =) graphs
- Parametric graphs
- Inequality graphs
- Polar coordinate (r =) graphs
- x = constant graphs
- Integration graphs (RUN mode only)

The Soft Menu

SEL - **[F1]** draw or non-draw status

DEL - **[F2]** delete function

TYPE - **[F3]** graph type menu

COLR - **[F4]** graph color

GMEM - **[F5]** graph memory save/recall

DRAW - **[F6]** graph draw

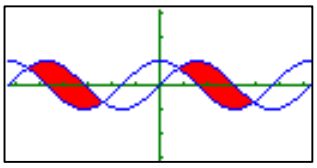
Inequalities

Example:

15. Graph Y < sin x
and Y > cos x

Press **[F3]** for "TYPE"
[F6]
[F2]
[sin]
[x,θ,T]
[EXE]

Press **[F3]**
[F6]
[F1]
[cos]
[x,θ,T]
[EXE]
To graph press **[F6]** OR **[EXE]**

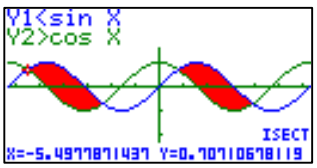


Graph Solve

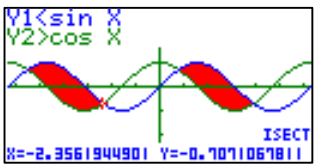
Example:

16. Find the intersection points determined by the boundaries for the above inequalities.

Press **[F5]** for "G-Solv" {Graph-Solve} and **[F5]** again for "ISCT" {Intersection}.



Notice that this gives the intersection point to the far left. By pressing **[▸]** you can find the next intersection point.

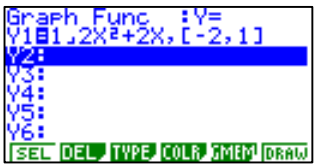


Graphing in a Specific Range

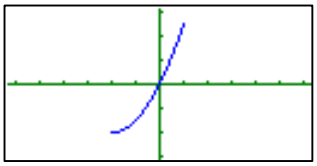
This will graph a function given a specific interval.

Example:

17. Graph $y = {}^{1}/_{2}x^2 + 2x$ within the range of $-2 \leq x \leq 1$.



Press **[F2], [F1]** to delete all previously entered functions.
Change "TYPE" to "Y="
Enter the equation **[,]**
[SHIFT], **[+]** {for the left bracket}
-2
[,]
1
[SHIFT], **[-]** {for the right bracket}**[F6]**



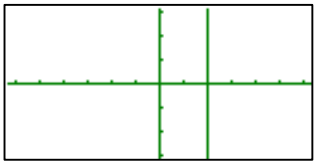
Vertical Lines

{Delete all previously entered functions using **[F2]** and **[F1]**}

Example:

18. Graph x = 2

Press **[F3] [F4]**, and 2.



Greatest Integer Function

{Delete all previously entered functions using **[F2]** and **[F1]**}

Example:

19. Graph Y = [x]

Press **[F3]**
[F1]
[OPTN]
[F5]
[F5]
[x]
[EXE]

Press **[SHIFT]**
[MENU]
[F2]
[EXE]
This changes the graph
to "plot" rather than "connect".
Press **[F6]**

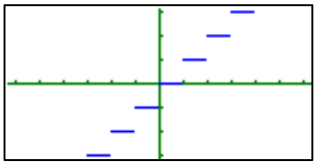
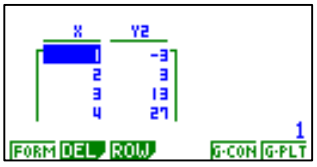


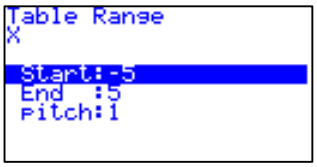
Table Menu

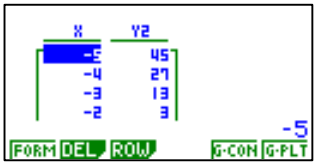
Press **[MENU]**
Go to TABLE menu
[F6]



To change the range:
[EXIT]
[F5]
*Enter new range $[-5, 5]_1$

*****This notation indicates:
$[\text{ min, max}]_{\text{scale}}$





Polar and Rectangular Equations

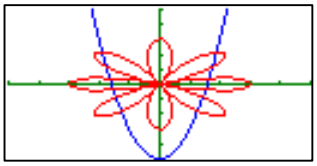
{Delete all previously entered functions using **[F2]** and **[F1]**}

Example:

20. Graph $r = 3\cos 4\theta$
and $Y1 = 2x^2 - 5$

Use the following View Window:
x [-5, 5]$_1$
y [-5, 5]$_1$

Press **[SHIFT]**, **[MENU]** for setup
[F1]
[EXE] to change Draw Type to Connect.



Press **[F3]**
[F2]
Enter first equation
[EXE]

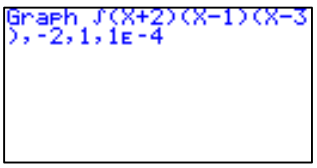
Press **[F3]**
[F1]
Enter second equation
[EXE]
[F6] or **[EXE]** to graph

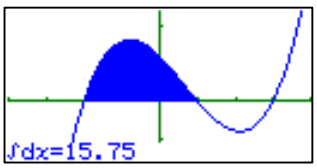
Integration

Example:

21. Graph the following with a "tol" = 1E –4

$$\int_{-2}^{1} (x+2)(x-1)(x-3)\,dx$$





To clear the screen:
from the **RUN** menu,
press **[SHIFT]**
[F4]
[F1]
[EXE]
Change the V-WIN to:
x[-4, 4]$_1$
y[-8, 12]$_5$

To change function type to Y=:
press **[SHIFT]**
[MENU]
[▼]
[F1]
[EXE]

Press **[SHIFT]**
[F4]
[F5]
[F5]
enter in the expression
enter **[,]**
–2 **[,]**
1 **[,]**
1 **[EXP]** –4
[EXE]

Notes:

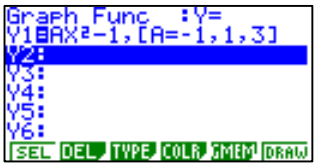
Overwrite

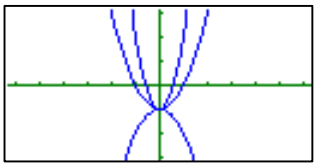
This will display multiple versions of the graph using the specified values. All versions will appear simultaneously.

Example:

22. Graph $y = Ax^2 - 1$, where A is –1, 1 and 3.

Delete all previous entries.
Set V-WIN to "INIT" **[F1]**
Choose the **[TYPE]** of graph, in this case **[Y=]** which is **[F1]**
Enter in equation using **[ALPHA], [x,θ,T]** for "A".
Press **[,]**
[SHIFT], **[+]** {for left bracket}
[ALPHA], **[x,θ,T]**
[SHIFT], **[.]** {for equal sign}
-1, **[,]**
1, **[,]**
3
[SHIFT], **[-]** {for right bracket}
[EXE]
[EXE]





Notes:

Dynamic Graph Menu

This menu allows user to view changes in a graph as parameters change on its equation.

Manually Entering Equations

Example:

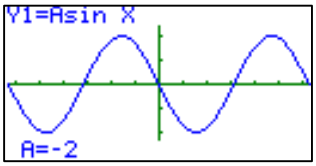
23. Determine the effect *a* has on the equation y = *a* sin x.

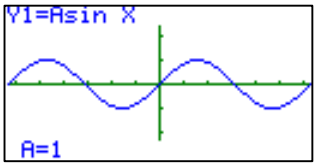
Press **[ALPHA] [A]**
[sin]
[x,θ,T]
[EXE]

Press **[F4]**
[F2]
-2, **[EXE]**
2, **[EXE]**
1, **[EXE] [EXE]**

Press **[F3]**
Highlight "Normal"
[F1]
[EXE]

[F6]





Using Built-in Functions

24. Determine the effect that a, b and c has on the function $y = a(x + b)^2 + c$.

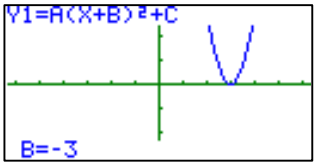
Press **[F5] [▼]**
[F1]

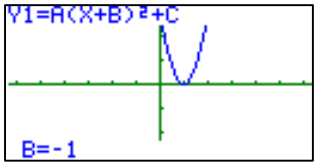
Press **[F4]**
[F2]
-3, **[EXE]**
3, **[EXE]**
1, **[EXE] [EXE]**

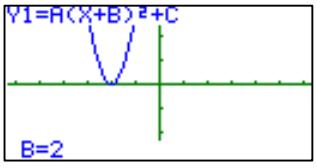
Press **[F3]**
Highlight "Normal"
[F1]
[EXE]

To select the variable to "move", use the up/down arrows to highlight the variable B and press **[F1]**.

[F6]





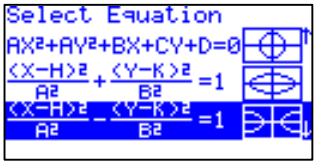


Conics Menu

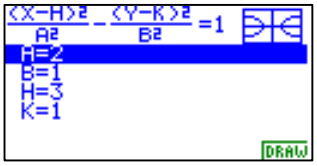
This mode graphs parabolas, circles, ellipses and hyperbolas.

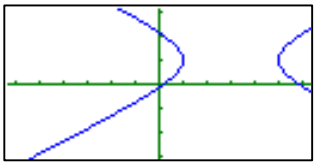
Example:

25. Graph $\dfrac{(x-3)^2}{4}-\dfrac{(y-1)^2}{1}=1$

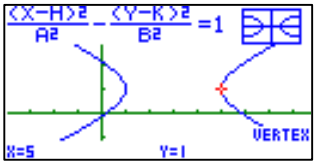


Use the down arrow to select the correct form.
[EXE]
Enter the values for A, B, H and K and press **[F6]**

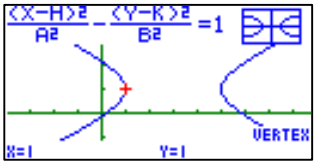




To change the view screen, use the up, down, left and right arrows.
Press **[F5]** for the Graph-Solve option
[F4]



Use the left or right arrow to find the remaining vertex.



Notes:

Equation Menu

This menu is used to solve three types of equations.

- Linear equations with two to six unknowns
- Quadratic equations
- Cubic equations

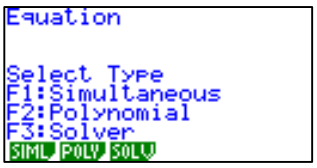
Quadratic and Cubic Equations

Example:

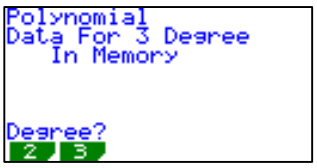
Real Solutions

26. Solve $x^3 - 2x^2 - x + 2 = 0$

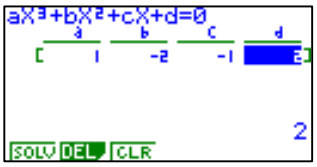
Press **[F2]**



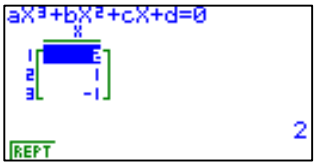
[F2]



Enter the coefficient of each term followed by **[EXE]**.



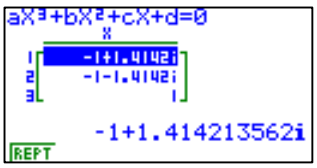
Press **[F1]** or **[EXE]** to solve.



Complex Solutions

27. Solve $x^3 + x^2 + x - 3 = 0$

Press **[F1]** (REPT)
[F3] (CLR)
Enter coefficients
[F1]

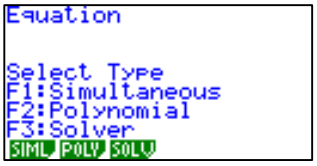


Simultaneous Equations

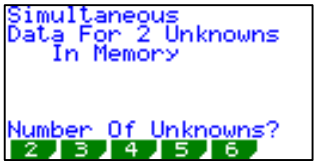
Example:

28. Find the solution to the system: $5x + 7y = -11$
$\frac{3}{4}x - \frac{1}{2}y = 3$

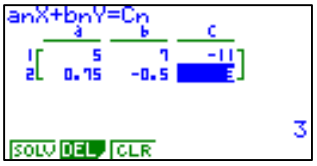
Press **[F1]**



Press **[F1]**



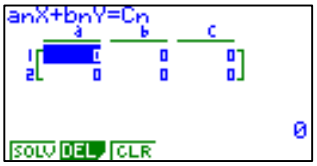
Enter coefficients



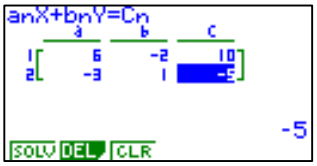
Press **[F1]**

29. Find the solution to the system: $6x - 2y = 10$
$-3x + y = -5$

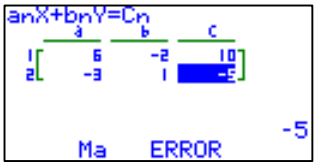
Press **[F1]** for REPT
[F3] to clear entries



Enter coefficients



Press **[F1]**

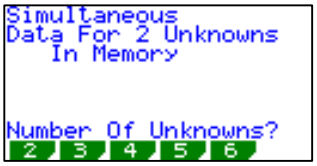


Press AC/ON to continue.

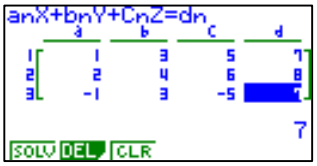
---

30. Find the solution to the system: $x + 3y + 5z = 7$
$2x + 4y + 6z = 8$
$-x + 3y - 5z = 7$

Press **[EXIT]**
[F2]



Enter coefficients



Press **[F1]**

Press **[SHIFT][$a^b/_c$]**

Notes:

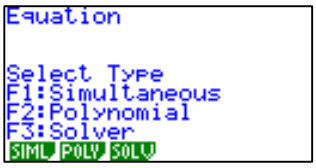
Solve Calculations (9850 *plus* model only)

Example:

31. Calculate initial velocity of an object thrown into the air and taking a time of 2 seconds to reach a height of 14 meters, when gravitational acceleration is 9.8 m/s^2.

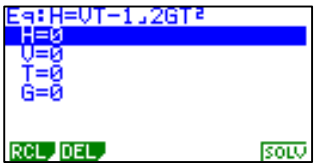
The following formula expresses the relationship between height H, initial velocity V, and gravitational acceleration G of a free falling object.

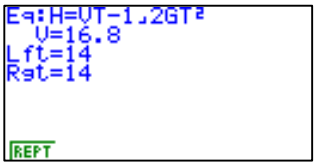
$$H = VT - \tfrac{1}{2} GT^2$$



Press **[F3]**
Press **[ALPHA] [H]**
[SHIFT] [=] (above ".")
[ALPHA] [V]
[ALPHA] [T]
[-] [½] be certain not to enter (-)
[ALPHA] [G]
[ALPHA] [T] [x^2]
[EXE]

Enter values for
H = 14 **[EXE]**
V = 0 **[EXE]**
T = 2 **[EXE]**
G = 9.8 **[EXE]**
up arrow to highlight
"V = 0"
[F6]





Statistics Menu

This menu will allow input of statistical data into lists, perform single-variable and paired-variable statistical calculations, perform tests, analyze data and draw statistical graphs.

The Soft Menu

GRPH – Graph menu which allows graphing of data as a scatter diagram, xy line, normal probability plot, histogram, med-box, mean-box, and many more.

CALC – Statistical calculation menu which allows single-variable and paired-variable statistical calculations.

TEST – Test menu that performs z tests, t tests, etc.

INTR – Confidence interval menu

DIST – Distribution menu

SRT-A and SRT-D – Sorts data in ascending/descending order.

DEL and DEL-A – Deletes highlighted data or all data.

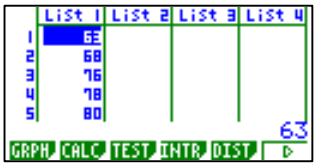
INS – Inserts new cell at highlighted cell.

Single-variable Statistics

Example:

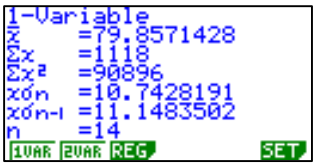
32. Enter the following into List 1.

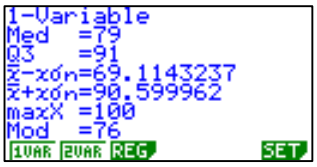
63	68	76	78	80	91	94
63	76	76	80	82	91	100



Enter each data point followed by **[EXE]**.

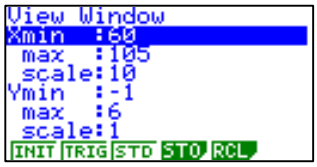
Press **[F2]**
[F1]
Press the down arrow to view all information.



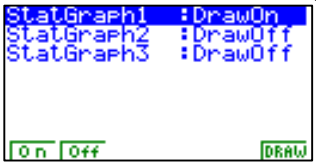


Press **[EXIT]** twice
[F1]
[F6]
[▼]
[F6]
[F1]
Make sure that the Xlist is "List1" and Frequency is "1"
[EXE]

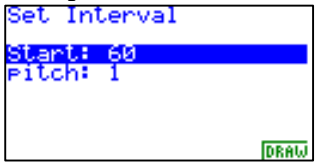
Press **[SHIFT]**, **[F3]**
Set your window to:
$x[60,105]_{10}$
$y[-1,6]_1$
[EXE]



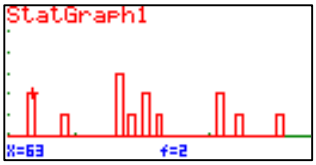
Press **[F1]**
[F4]
Make sure that "StatGraph1" is the only graph with "DrawOn".



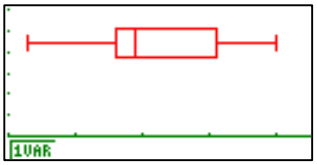
[F6]
Set "Start" to 60
Set "pitch" to 1



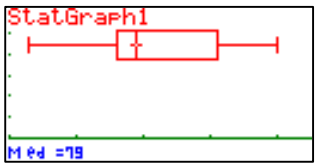
Press **[F6]** to graph.
Press **[SHIFT] [F1]**
Use left/right arrow keys to view frequencies.
Use **[SHIFT] [F6]** to toggle between list and graph.



Press **[F6]**
[▼]
[F6]
[F2]
[EXE]
[F1]



Press **[SHIFT]**
[F1]
to view the stat information



Paired-variable Statistics

Example:

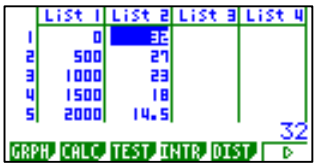
33. Enter the following into List 1.

0	500	1000	1500
2000	2500	3000	3500

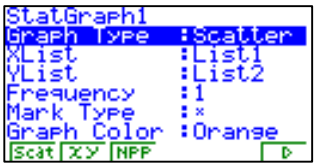
Enter the following into List 2.

32	27	23	18
14.5	9	3.5	-3

Press **[F6] [F4] [F1]** to clear List 1.
Enter each data point followed by **[EXE]**.
Press right arrow to go to List 2.



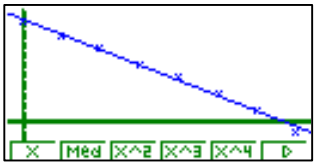
Press **[F6]**
[F1]
[F6]
[▼]
[F1]



Press **[EXIT]**
[F1]

Troubleshooting:
If the screen is not fitting to the data, press **[SHIFT] [MENU]** and check that the "Stat Wind" is set to "Auto".

Press **[F1]**
[F6]

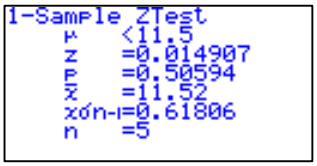


Tests

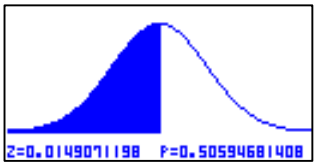
Example:

34. Perform a 1-Sample Z Test where List1 = {11.2, 10.9, 12.5, 11.3, 11.7}, where $\mu_0 = 11.5$ and $\sigma = 3$ ($\mu < \mu_0$).

Delete all Lists
Enter data above in List1
Press **[F3]** (Test)
[F1] (Z)
[F1] (1-S)
[F1] (List)
[▼] [F2] (<)
[▼] 11.5 **[EXE]**
3 **[EXE]**
[F1] (list1)
[▼] [F1] (1)
[▼] [F1] (CALC)



[EXIT]
Press down arrow to "Execute"
Press **[F6]** to draw.



Notes:

Matrix Menu

This mode is used for storing and editing matrices. Matrix operations are performed in the RUN menu.

Creating a matrix

A = $\begin{bmatrix} 3 & 5 \end{bmatrix}$

Highlight "Mat A"
1 **[EXE]**
2 **[EXE]**
to enter dimensions of matrix A.
3 **[EXE]**
5 **[EXE]**
[EXIT]

B = $\begin{pmatrix} 1 & 7 \\ 3 & 8 \end{pmatrix}$

down arrow to highlight "Mat B"
2 **[EXE]**
2 **[EXE]**
to enter dimensions of matrix B.
1 **[EXE]**
7 **[EXE]**
3 **[EXE]**
8 **[EXE]**
[EXIT]

C = $\begin{pmatrix} 2 & -2 \\ 4 & -1 \end{pmatrix}$

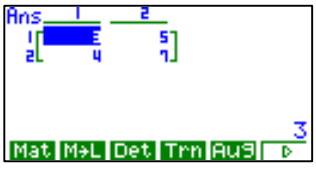
Repeat for matrix C

Matrix Operations

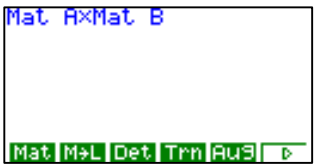
Example:

35. B + C
From the RUN menu:
Press **[OPTN]**
[F2]
[F1]
[ALPHA] [B]
[+]
[F1]
[ALPHA] [C]

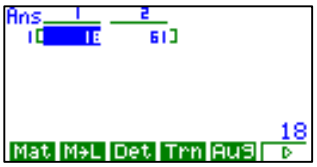
[EXE]



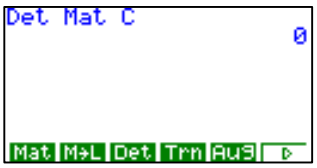
36. A • B
[F1]
[ALPHA] [A]
[X]
[F1]
[ALPHA] [B]



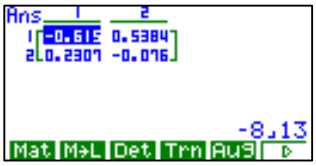
[EXE]



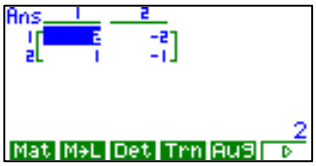
37. Det [C]
[F3]
[F1]
[ALPHA] [C]
[EXE]



38. B^{-1}
[F1]
[ALPHA] [B]
[SHIFT] [x^{-1}] (above ")")
[EXE]



39. C^{2}
[F1]
[ALPHA] [C]
[x^2]



Notes:

Time Value of Money Menu *9850 *plus* model only*

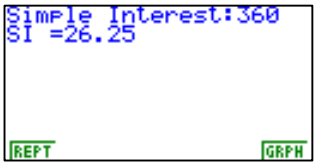
This menu will perform financial calculations such as simple/compound interest, investment appraisal (cash flow), amortization, interest rate conversion, etc.

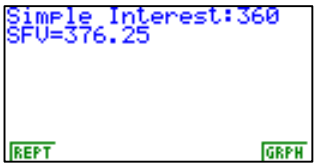
Simple Interest

Example:

40. Find the interest on a $350 loan for 6 months at 15%.
Press **[F1]**
[SHIFT] [MENU]
Change "Date Mode" to "360"
[EXE]
Enter:
n = 180 (number of days in 6 months)
I% = 15

PV = -350
[F1] to determine amount of interest
[EXIT]
[F2] to determine interest + loan





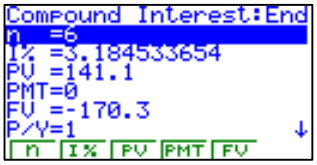
Compound Interest

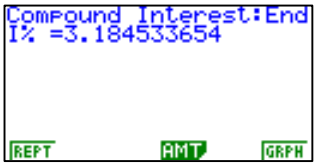
Example:

41. Find the annual compounded rate of increase on money that increased from $141.1 billion to $170.3 billion over a six-year period.

Press **[F2]** from TVM menu
[SHIFT] [MENU]
Change "Payment" to "End"
[EXE]
Enter:

n = 6
I% = 0
PV = 141.1
PMT = 0
FV = -170.3
P/Y = 1
C/Y = 1
Press **[F2]** to determine rate of increase





Notes:

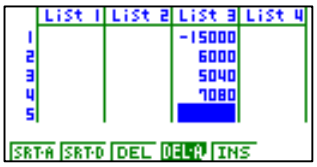
Cash Flow / Investment Appraisal

Example:

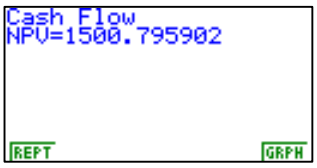
42. An investment of $15,000 in machinery projects the annual revenues shown in the table below (all revenues realized at the end of the fiscal year). What is the net profit or loss of this investment if the useful service of life of the machine is 3 years, the resale value after three years is $2,500, and the capital cost is 11%?

Year	Revenues
1	$6000
2	$5040
3	$7080 + 2500

From the **LIST** menu:
[▸] [▸] to List 3
[(-)] 15000 **[EXE]**
6000 **[EXE]**
5040 **[EXE]**
7080 **[+]** 2500 **[EXE]**



From the **TVM** menu:
[F3]
Enter I% = 11 **[EXE]**
Press **[F6]**
[F3]
[F1]



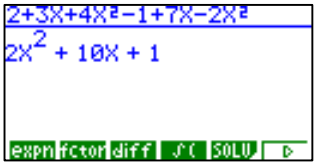
Notes:

The Algebraic Mode provides tools for expansion of algebraic expressions, factoring, etc. In this mode, differential and integration calculation results are displayed as mathematical expressions instead of decimal values.

Simplifying Algebraic Expressions

Example:

43. Simplify $2 + 3x + 4x^2 – 1 + 7x – 2x^2$

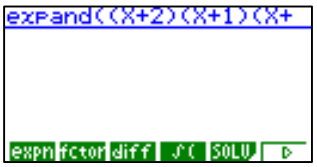


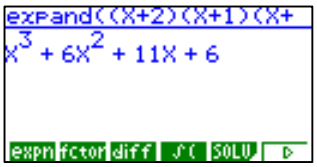
Enter the expression as it appears and press **[EXE]**

Expansion – [expn]

Example:

44. Expand $(x + 2)(x + 1)(x + 3)$





Press **[F1]** for [expn]
Enter expression making certain to include ALL parentheses
[EXE]

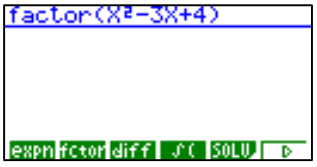
Factorization – [fctor]

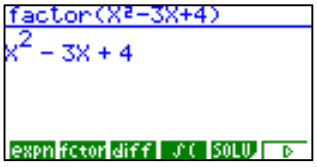
This command will factor algebraic expressions and find the prime factorization of numbers.

Example:

45. Factor $x^2 + 3x – 4$

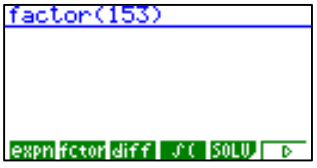
Press **[F2]** for [fctor]
Enter expression
[ )]
[EXE]

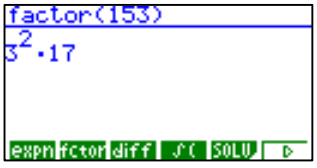




46. Find the prime factorization of 153.

Press **[F2]** for [fctor]
Enter 153
[ )]
[EXE]



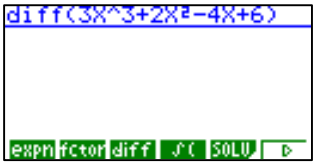


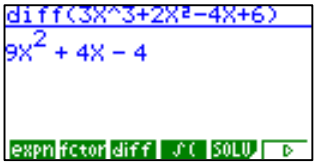
Derivatives – [diff]

Example:

47. Find the derivative of $3x^3 + 2x^2 – 4x + 6$

Press **[F3]** for [diff]
Enter the expression
[ )]
[EXE]



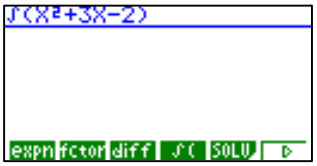


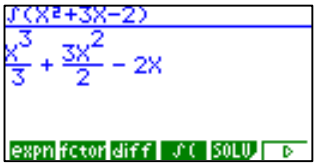
Integration - [∫]

Example:

48. Find the integral of $x^2 + 3x – 2$ with respect to x

Press **[F4]** for [∫]
Enter the expression
[ )]
[EXE]





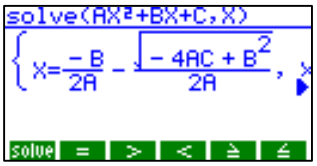
Solve – [SOLV]

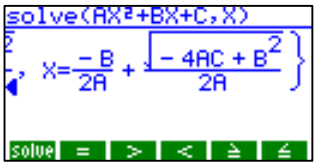
This command will calculate solutions for an expression. Solutions are displayed as mathematical expressions.

Example:

49. Solve $ax^2 + bx + c = 0$ for x

Press **[F5]** for [SOLV]
[F1] for [solve]
Enter the left side of the equation
[,]
[x]
[ )]
[EXE]

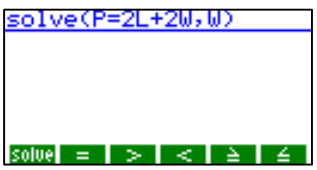


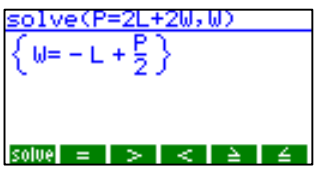


Note: to view the entire solution, use the right arrow key to scroll over.

50. Solve P = 2L + 2W for W

Press **[F1]** for [solve]
Enter the entire equation {the "=" is accessed by entering **[SHIFT] [.]**}
[,]
[W]
[ )]
[EXE]

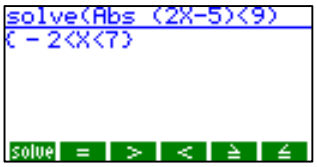




51. Solve | 2x – 5 | < 9

Press **[F1]** for [solve]
[OPTN]
[F1] for [Abs]
[( ]
2x – 5
[ )]
[EXIT]
[F5] for [SOLV]
[F4] for [<]
9
[ )]
[EXE]


solve(Abs (2X-5)<9)
solve
=
>


solve(Abs (2X-5)<9)
{ -2<X<7}
solve
=
>

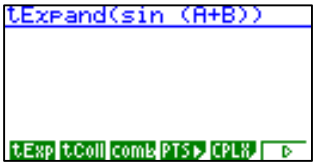
Addition Theorems – [tExp]

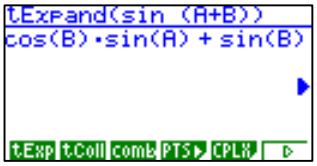
This command uses trigonometric addition theorems to transform an expression.

Example:

52. Transform *sin*(A + B) using the addition theorems

From the main ALGBR screen, press **[F6]** for [▸]
[F1] for [tExp]
[sin]
[( ]
A + B
[ )] [ )]
[EXE]


tExpand(sin (A+B))
tExp
tColl
comb
PTS▸
CPLX


tExpand(sin (A+B))
cos(B)·sin(A) + sin(B)
tExp
tColl
comb
PTS▸
CPLX

Note: remember that to view the remainder of the solution, press the right arrow key to scroll.

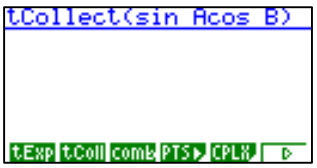
Product-to-Sum Transformation – [tColl]

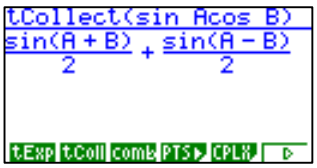
This command uses addition theorems to perform product-to-sum transformation.

Example:

53. Perform product-to-sum transformation on sinA + sinB using addition theorems

Press **[F2]** for [tColl]
[sin] [ALPHA] A **[cos] [ALPHA]** B
[ )]
[EXE]


tCollect(sin Acos B)
tExp
tColl
comb
PTS▸
CPLX



Notes:

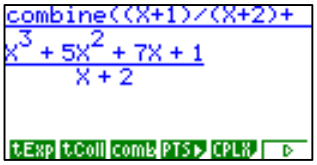
Combine – [comb]

This command produces a fraction made up of fully expanded numerator over a fully expanded denominator.

Example:

54. Simplify $\frac{(x+1)}{(x+2)} + x(x+3)$

Press **[F3]** for [comb]
[( ] x + 1
[ )] [÷]
[( ] x + 2
[ )] [+]
x **[( ]** x + 3 **[ )] [ )]**
[EXE]



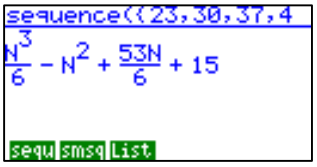
Sequence – [sequ]

This command creates the function that describes the relationship between the variable and the value of the expression, if the value of the expression is entered when the variable is assigned the first specified <value>, the second specified <value>, and so on. The function is a linear algebra expression.

Example:

55. Find the expression when the first 4 values are {23, 30, 37, 45}

Press **[F4]** for [PTS ▸]
[F1] for [sequ]
[SHIFT] [X] for "{"
Enter the values separating each with a comma
[SHIFT] [÷] for "}"
[,] N **[ )]**
[EXE]



Note: If List 1 = {23, 30, 37, 45}, the same result can be obtained by inputting the following: sequence(List 1, N)

Notes:

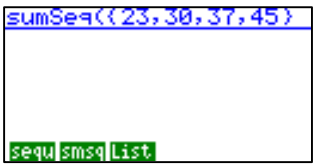
Sum of Sequence – [smSq]

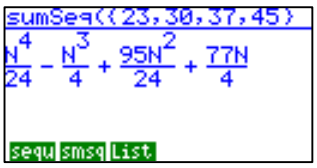
This command obtains a function that expresses the sum up to the *n*th term of a sequence of numbers. The function is a linear algebra expression.

Example:

56. Find the expression that expresses the sum up to the *n*th term when the first 4 values are {23, 30, 37, 45}.

Press **[F2]** for [smSq]
[SHIFT] [X] for "{"
Enter the values separating each with a comma
[SHIFT] [÷] for "}"
[,] N **[ )]**
[EXE]





Note: If List 1 = {23, 30, 37, 45}, the same result can be obtained by inputting the following: sumSeq(List 1, N)

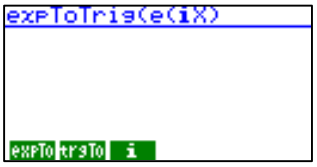
Complex Exponential-to-Trigonometric Transformation – [expTo]

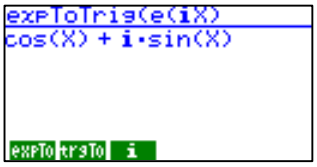
This command transforms an exponential function whose exponent includes an imaginary number to a trigonometric function.

Example:

57. Transform $\mathbf{e^{ix}}$ to an exponential function

From the main ALGBR screen, press **[F6]** for [▸]
[F5] for [CPLX]
[F1] for [expTo]
[SHIFT] [ln] for e^x
[( ] [F3] for [i]
[x,θ.T] [ )]
[EXE]





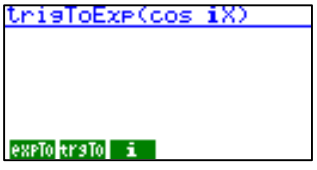
Complex Trigonometric-to-Exponential Transformation – [trgTo]

This command transforms a trigonometric function whose argument is an imaginary number to an exponential function.

Example:

58. Transform **cos iX** to an exponential function

Press **[F2]** for [trgTo]
[cos] [F3] for [i]
[x,θ.T] [ )]
[EXE]



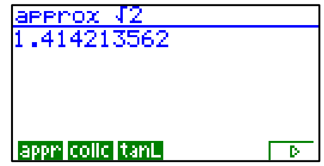
Convert to Numeric Value – [appr]

This command converts an expression to a numeric value.

Example:

59. Convert √2 to a numeric value

From the main ALGBR screen, press **[F6]** for [▸] and **[F6]** for [▸]
Press **[F1]** for [appr]
[SHIFT] [x^2] for "√"
2 **[EXE]**

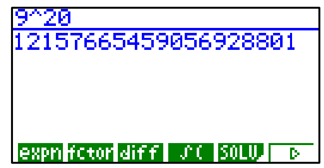


What is the difference between "approx" and standard calculations?

- **Approx** differs from standard calculations (calculations that do not use natural display notation) in the number of display digits and handling of variables. With standard calculations, calculation results are displayed without using exponential notation.

60. Evaluate 9^{20}

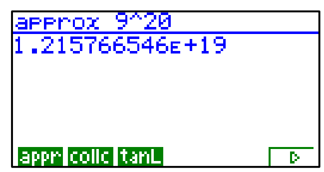
From the main ALGBR screen, enter the expression
Press **[EXE]**



OR

- With **approx**, calculation results are displayed using exponential notation. As with the RUN Mode, the mantissa can have up to 10 digits and the exponent up to two digits. The number of digits that can be input for **approx** depends on the setting of the set up screen's Display item.

[F1] for [appr]
Enter the expression
[EXE]
{Display: Norm 1}

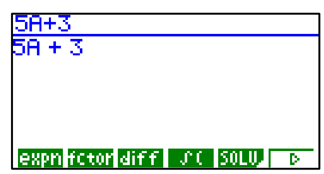


~~~~~~

- When part of the expression includes a variable, the variable is processed as a variable regardless of whether or not it has been assigned a value.

61. 5a + 3

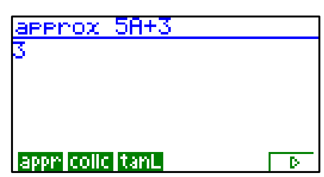
From the main ALGBR screen, enter the expression
[EXE]



OR

- When part of the expression includes a variable, the calculation is performed by substituting the value for the variable. The following shows the calculation when A=0.

[F1] for [appr]
Enter the expression
[EXE]


~~~~~~

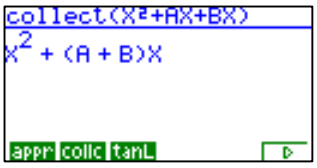
Collection – [collc]

This command arranges the terms of an expression, focusing on a particular variable.

Example:

62. Arrange the terms of the expression $x^2 + ax + bx$, focusing on the variable x

From the main ALGBR screen, press **[F6]** for [▸] and **[F6]** for [▸]
[F2] for [collc]
Enter the expression
[ )]
[EXE]



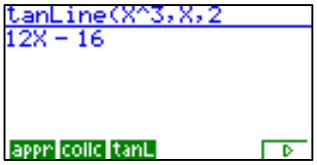
Tangent Expression – [tanL]

This command calculates the tangent expression of another expression.

Example:

63. Calculate the tangent expression when x = 2 for the expression x^3

Press **[F3]** for [tanL]
Enter the expression
[,] [x] [,] 2
[EXE]



Notes: