Preface

Educational methods are always in progress to fulfill students' needs and to empower their thoughts.

Now days technology is taking a large pace in teaching, gave more techniques, ways and new approaches in teaching. Calculators are one of educational technology tools that support math classes and students.

In this booklet we will demonstrate how to apply the usage of calculator FX-991EX in various math subjects.

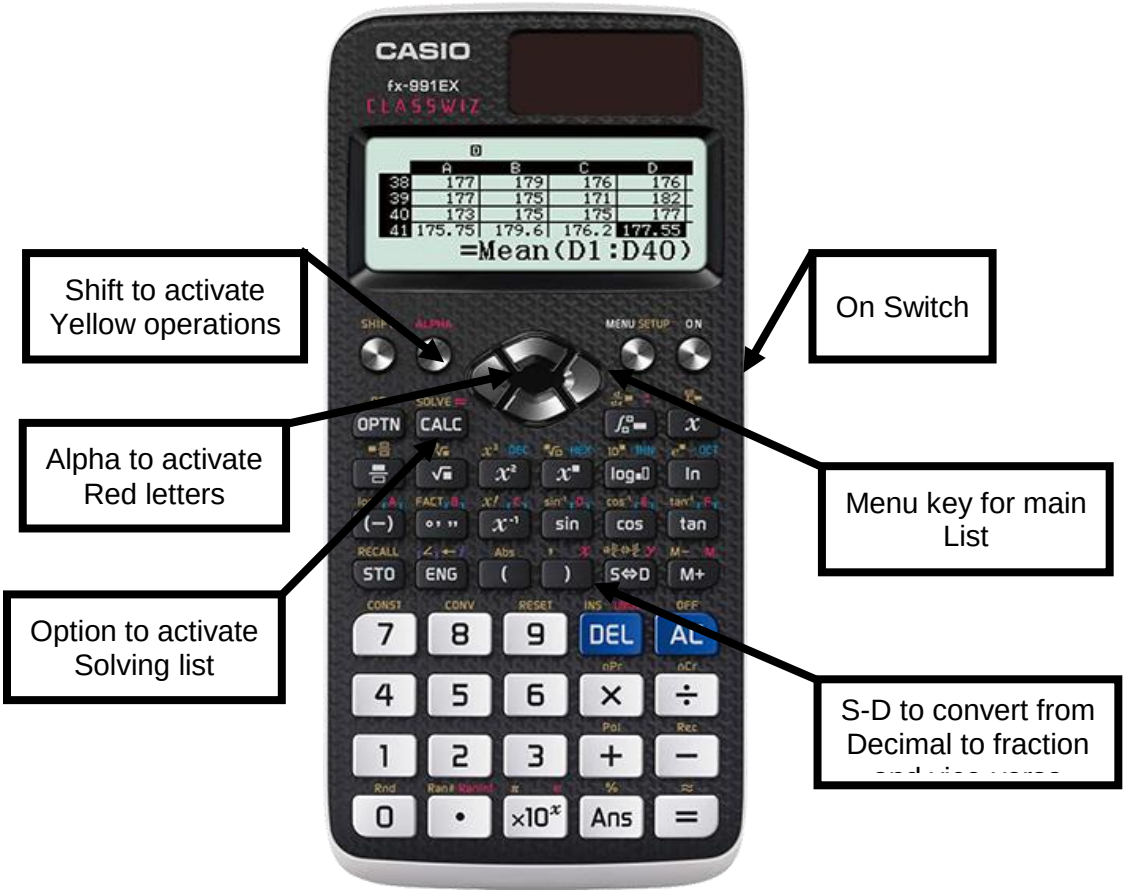
FX-991EX Overview

Main keys:

1. ON: Turns on the calculator [ON]
2. Menu : Calculator main page [MENU]
3. Shift : Activates all yellow functions [SHIFT]
4. Alpha : Activate all Red functions [ALPHA]
5. AC : Clear screen [AC]
6. DEL: Delete terms separately [DEL]
7. Option: Transfer to more detailed calculation options [OPTN]

To turn off calculator: [SHIFT] [AC]

To reset calculator: [SHIFT] [9] [3] [=] [AC]



Calculator SET UP

Calculator setup which is exactly as the setting of the calculator where the user can change the format of screen result to desired outcome:

1- Input/output

```
1:MathI/MathO
2:MathI/DecimalO
3:LineI/LineO
4:LineI/DecimalO
```

2- Number Format

```
1:Fix
2:Sci
3:Norm
```

3- Angle Unit

```
1:Degree
2:Radian
3:Gradian
```

4- Engineering Symbol

```
Engineer Symbol?
1:On
2:Off
```

5- Fraction Result

```
1:ab/c
2:d/c
```

6- Complex

```
1:a+bi
2:r∠θ
```

7- Statistics

```
Frequency?
1:On
2:Off
```

8- Spreadsheet

```
1:Auto Calc
2:Show Cell
```

9- Equation/Function

```
Complex Result?
1:On
2:Off
```

10- Table

```
1:f(x)
2:f(x),g(x)
```

11- Decimal Mark

```
1:Dot
2:Comma
```

12- Digit separator

```
Digit Separator?
1:On
2:Off
```

13- Multi line Font

```
1:Normal Font
2:Small Font
```

14- QR Code

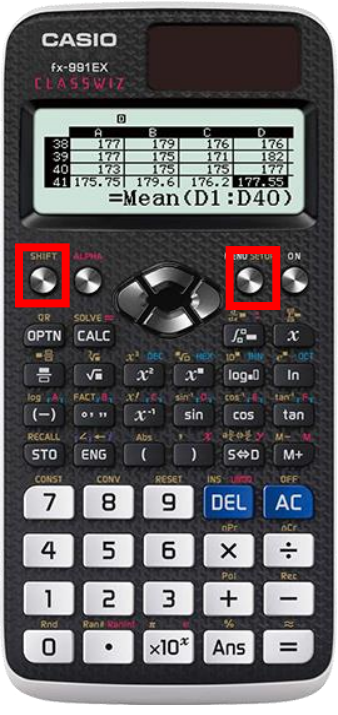
```
1:Version 3
2:Version 11
```

15- Contrast

```
Contrast

Light          Dark
 [◄]           [►]
```

To Activate Setup: SHIFT MENU



Sample Problems Using FX-991EX

1- Rounding and Scientific Notation
2- Prime Factorization
3- Fractions
4- Order of Operation
5- Radicals
6- Unit Conversion
7- Solving Equations of degree one ,Logarithmic and Exponential
8- Complex number
9- Statistics
10- Equations Degree two to Degree 4
11- System of 2,3,and 4 unknowns
12- Inequalities 2^{nd} ,3^{rd} , 4^{th} Degree
13- Angle Conversion
14- Table
15- Matrices
16- Vectors
17- Derivative
18- Integral
19- Spreadsheet

Rounding and Scientific Notation

1) Rounding

Round each number to nearest hundredths:

While in mode 1 (calculate) change setup of number to Fix then choose your rounding method

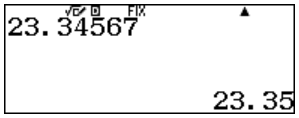
Steps using calculator: SHIFT MENU 3 1 2

Now calculator is setup on rounding to nearest hundredths .After setting up the calculator and empty screen will appear. Type the number needed and click equal key the answer will be directly rounded.

Example:

a) Round the following number to nearest hundredths:
$23.34567 = 23.35$

2 3 • 3 4 5 6 7 =



b) Round to nearest thousandths:

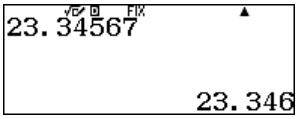
Whenever we need to change the desired rounding, we should log into set up and change the setting. SHIFT MENU 3 1 3

Then do the same steps above:

Example: Round the following number to nearest thousandths:

$23.345678 = 23.346$

2 3 • 3 4 5 6 7 8 =



Try by your self:

- Round to nearest ten thousands the number 56.78943
- Round to nearest hundred thousandths the number 0.3457479
- Round to nearest tenths the number 9.87345

When you are finished from the practice don't forget to reset your calculator

To reset the calculator follow the steps

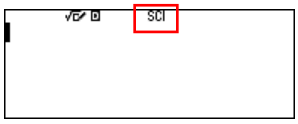
SHIFT 9 3 = AC

Scientific Notation

Before we log the calculator into scientific notation mode, make sure that the calculator is initialized.

To activate scientific notation we should log into set up and change number format to Sci , when doing so an empty screen will appear with notation sci on the top of the screen.

SHIFT MENU 3 2 0



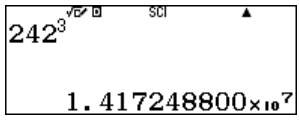
Now calculator is set up on scientific notation, to get the result of the desired number in scientific notation we only need to type the number then click equal key, then result will appear

Example:

Write the following numbers in scientific notation:

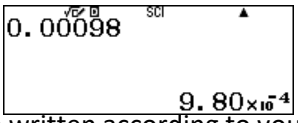
a) 242^3

2 4 2 $x^{\blacksquare}$ 3 =



b) 0.00098

0 • 0 0 0 9 8 = S⇔D



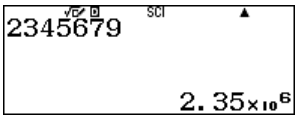
Note: you can choose scientific notation to be written according to your desired number of digits.

Example:

Write the number 2345679 in 3 digit scientific notation

1st set up calculator

SHIFT MENU 3 2 3



Then type the number

2 3 4 5 6 7 9 =

Try by yourself:

Write each in scientific notation:

- 458.98732
- 0.005667

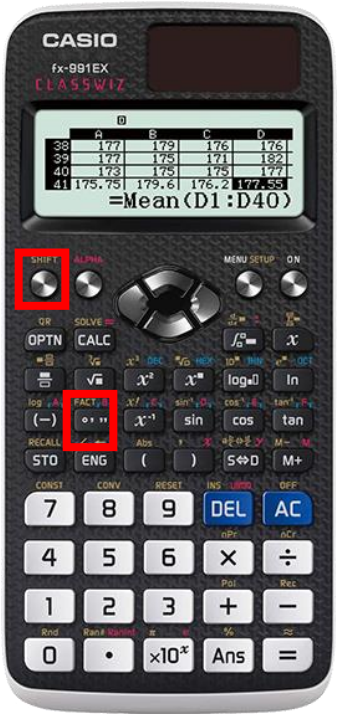
  Note: when finished from practice initialize the calculator

2) **Prime Factorization**

Prime Factorization helps students to check whether numbers are prime or composite and to simplify radicals.

In order to get the prime factorization of a number first we should be in calculation mode [MENU] [1]

Then type desired number, click equal key, and later activate prime factorization by [SHIFT] [°'"]



Example:

What is the prime factorization of the following numbers?

a) 44444

[4] [4] [4] [4] [4] [=] [SHIFT] [°'"]

44444

$2^2 \times 41 \times 271$

b) 56872

[5] [6] [8] [7] [2] [=] [SHIFT] [°'"]

56872

$2^3 \times 7109$

Try by yourself:

Check whether the following numbers are prime or composite?

- 231
- 498
- 111
- 263

3) Fractions.

Dealing with fractions using CASIO FX-991EX is much flexible and faster.

The results will be:

- In simplest form
- Can be converted to decimal form

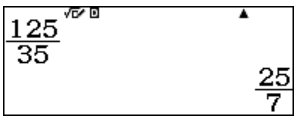
Analyses form:

- Students can find Greatest Common Divisor.
- Students can find Least Common Multiple

To work with fractions activate calculation mode [MENU] [1]

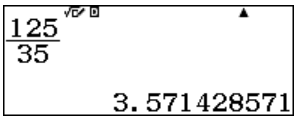
Example:

a) Write the given fraction $\frac{125}{35}$ in simplest form:



Steps using calculator: [▣] [1] [2] [5] [▼] [3] [5] [=]

Result in decimal just click [S⇔D]

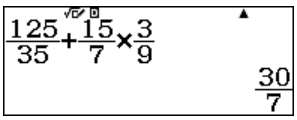


b) Write the result in simplest form

$\frac{125}{35} + \frac{15}{7} \times \frac{3}{9} =$

Steps using calculator:

[▣] [1] [2] [5] [▼] [3] [5] [▶] [+] [▣] [1] [5] [▼] [7] [▶] [×] [▣] [3] [▼] [9] [=]



c) What is the Greatest common divisor of $125\ and\ 35$

1st type fraction 125/35 on calculator

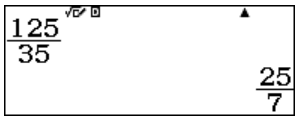
2nd divide the numerator of initial fraction by the numerator of the result fraction

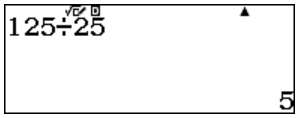
Steps using calculator:

1st [1] [2] [5] [▣] [3] [5] [=]

2nd [1] [2] [5] [÷] [2] [5] [=]

$Then\ GCD(125,35) = 5$





To calculate LCM:

Apply the formula:

$a \times b = GCD(a,b) \times LCM(a,b)$

$then\ LCM(125,35) = \frac{125 \times 35}{5} = 875$

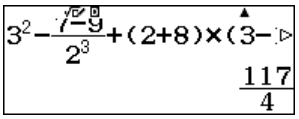
4) Order of Operation

The "operations" are addition, subtraction, multiplication, division, exponentiation, and grouping; the "order" of these operations states which operations take precedence (are taken care of) before which other operations.

It is important while using the calculator to type exactly the same expression on the calculator so the result will be correct.

Example:

Calculate: $3^2 - \frac{7-9}{2^3} + (2+8) \times (3-1) =$



Steps using calculator:

It is important to type all operations and numbers exactly the same from the question.

Try by yourself:

- $9^3 - 5 \times (8+12) =$
- $(12-8)^4 - \frac{18}{2} =$

5) Radicals

We'll open this section with the definition of the radical. If n is a positive integer that is greater than 1 and a is a real number then, $\sqrt[n]{a} = a^{\frac{1}{n}}$

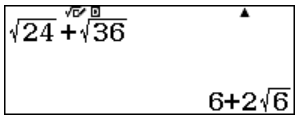
Where n is called the **index**, a is called the **radicand**, and the symbol $\sqrt{\ }$ is called the **radical**. The left side of this equation is often called the radical form and the right side is often called the exponent form.

Calculating radical expressions using calculator:

Example:

a) Simplify $\sqrt{24} + \sqrt{36}$

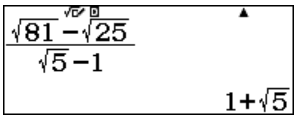
Steps using calculator: [√■] [2] [4] [▶] [+] [√■] [3] [6] [=]



b) Simplify : $\frac{\sqrt{81}-\sqrt{25}}{\sqrt{5}-1}$

Steps using calculator

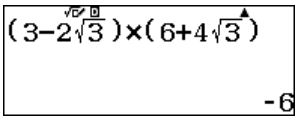
[▣] [√■] [8] [1] [▶] [−] [√■] [2] [5] [▼] [√■] [5] [▶] [−] [1] [=]



c) Simplify $(3 - 2\sqrt{3}) \times (6 + 4\sqrt{3})$

Steps using calculator

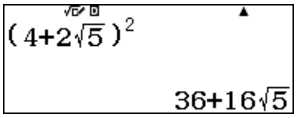
[(] [3] [−] [2] [√■] [3] [▶] [)] [×] [(] [6] [+] [4] [√■] [3] [▶] [)] [=]



d) Simplify $\left(4 + 2\sqrt{5}\right)^2$

Steps using calculator

[(] [4] [+] [2] [√■] [5] [▶] [)] [x^2] [=]



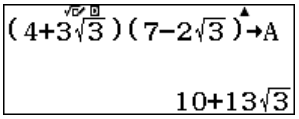
e) $A = \left(4 + 3\sqrt{3}\right)\left(7 - 2\sqrt{3}\right)$ *and* $B = \frac{3-2\sqrt{3}}{7-2\sqrt{3}}$

1) Simplify A and B

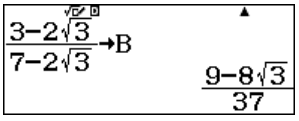
Store each expression in the calculator

steps using calculator

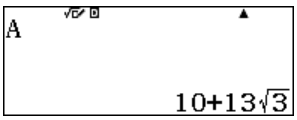
Store A: [(] [4] [+] [3] [√■] [3] [▶] [)] [(] [7] [−] [2] [√■] [3] [▶] [)] [STO] [(−)]



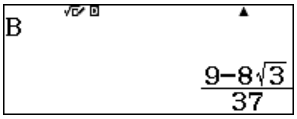
Store B: [▣] [3] [−] [2] [√■] [3] [▼] [7] [−] [2] [√■] [3] [STO] [,,,]



Simplify A: [ALPHA] [(−)] [=]

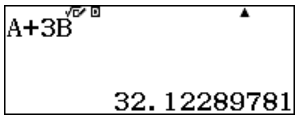


Simplify B: [ALPHA] [•,,,] [=]



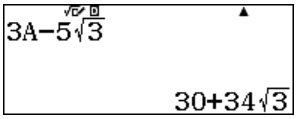
2) Simplify A+3B

[ALPHA] [(−)] [+] [3] [ALPHA] [•,,,] [=]



3) Simplify $3A - 5\sqrt{3}$

[3] [ALPHA] [(−)] [−] [5] [√] [3] [=]



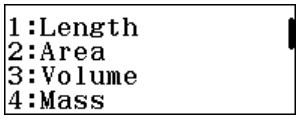
6) Unit conversion (metric conversion)

Metric system the system of units of measurement that is based on the meter, gram, and liter and in which new units are formed from the basic terms by prefixes denoting multiplication by a power of ten.

While using conversion stay in calculation mode [MENU] [1]

To activate conversion [SHIFT] [8]

Choose your desired type of conversion

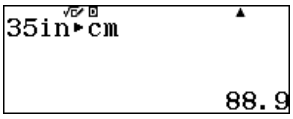


(In this example use length [1])

Example: Convert each to the given unit

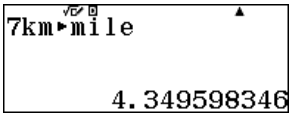
a) 35 in =……cm

[3] [5] [SHIFT] [8] [1] [1] [=] [S⇔D]



b) 7km= …….mile

[7] [SHIFT] [8] [1] [8] [=]



7) Solving Equations of Degree One ,Logarithmic and Exponential

Linear equations are also called **first degree equations**, as the highest power of the variable in these equations is 1.

Example: $x + 5 = 9$ is an equation of the first degree, which is often called a linear equation.

Solving 1st degree equations using FX-991EX

While solving 1st degree equations stay in calculation mode [MENU] [1]

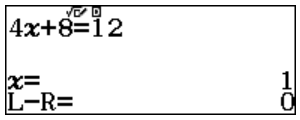
Example:

a) solve $4x + 8 = 12$

Type exactly the equation on calculator (Note: to type equal [ALPHA] [CALC])

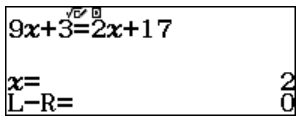
When equation is typed click [SHIFT] [CALC] [=] to solve the equation

[4] [x] [+] [8] [ALPHA] [CALC] [1] [2] [SHIFT] [CALC] [=]



b) Solve $9x + 3 = 2x + 17$

[9] [x] [+] [3] [ALPHA] [CALC] [2] [x] [+] [1] [7] [SHIFT] [CALC] [=]



Solving logarithmic equations:

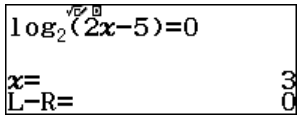
While solving logarithmic equations stay in calculation mode [MENU] [1]

As above type exactly the equation then click [SHIFT] [CALC] [=] to solve the equation

Example: Solve $\log(2x - 5) = 0$

Steps using calculator

[log▪□] [2] [▶] [2] [x] [−] [5] [▶] [ALPHA] [CALC] [0] [SHIFT] [CALC] [=]



Solving exponential equations:

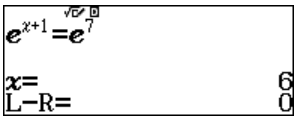
While solving logarithmic equations stay in calculation mode [MENU] [1]

As above type exactly the equation then click [SHIFT] [CALC] [=] to solve the equation

Example:

a) $e^{x+1} = e^7$

b) [SHIFT] [ln] [x] [+] [1] [▶] [ALPHA] [CALC] [SHIFT] [ln] [7] [SHIFT] [CALC] [=]



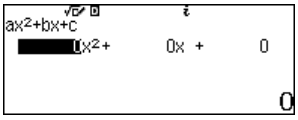
8) Solving Equation of Degree 2 to Degree 4

Solving equations of degree 2 using FX-991EX:

In order to solve any polynomial equation of degree 2 and higher log into Equations/Function mode

MENU (−) 2 then choose desired degree. In this section choose degree 2

Steps to choose solving equations of degree 2 : MENU (−) 2 2

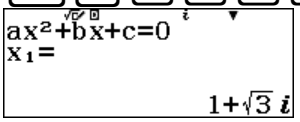


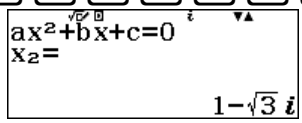
Then input the coefficients one after another by pressing equal key

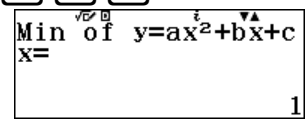
Example: $2x^2 - 4x + 8 = 0$

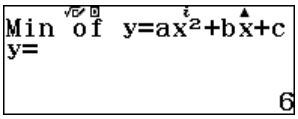
Steps using calculator:

MENU (−) 2 2 2 = − 4 = 8 = = = =









in this example the calculator post solutions whether they are real or complex, and also post the vertex of the parabola.

Analyses we can do out of the result:

- There are no x-intercepts.
- The vertex is above x-axis and open up word.
- Lowest value we can get is y=6 at x=1.
- Equation of axis of symmetry.
- Domain where the function is increasing or decreasing.

Note:

You can remove complex solution by clicking

SHIFT MENU ▼ ▼ 1 2

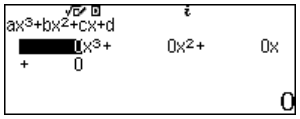
Solving equations of degree 3

In order to solve any polynomial equation of degree 2 and higher log into Equations/Function mode

MENU (−) 2 then choose desired degree. In this section choose degree 3

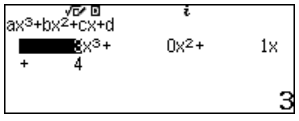
Steps to choose solving equations of degree 3

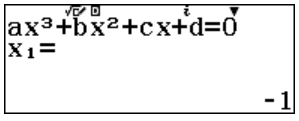
MENU (−) 2 3

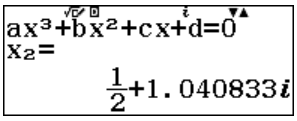


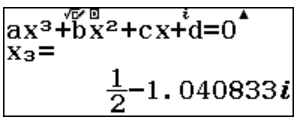
Example: $3x^3 + x + 4 = 0$

3 = 0 = 1 = 4 = = = =









In this example the calculator posts real and imagenary solutions.
It helps in factorizing cubic equations and knowing the multiplicity.

9) Solving System of Equations up to four Unknowns :

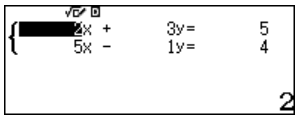
Solving system of equations 2 unknows:

In order to solve system of 2 unknows log into Equations/Function [MENU] [(–)] [1], and choose desired number of unknowns. In this session choose 2 unknowns

Example: solve the system below

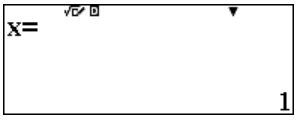
$$\begin{cases} 2x + 3y = 5 \\ 5x - y = 4 \end{cases}$$

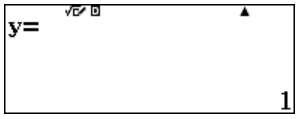
1st log into Simul equations [MENU] [(–)] [1] [2]



2nd insert coefficient one after another by pressing equal key

Steps to fill up the system: [2] [=] [3] [=] [5] [=] [5] [=] [−] [1] [=] [4] [=] [=] [=]





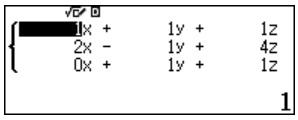
Solving system of equations 3 unknowns

In order to solve system of 2 unknows log into Equations/Function [MENU] [(–)] [1], and choose desired number of unknowns. In this session choose 3 unknowns

Example: Solve the below system

$$\begin{cases} x + y + z = 3 \\ 2x - y + 4z = 8 \\ y + z = 1 \end{cases}$$

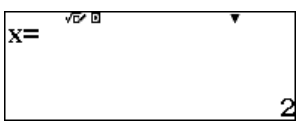
1st log into Simul equations [MENU] [(–)] [1] [3]

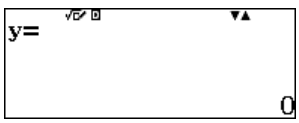


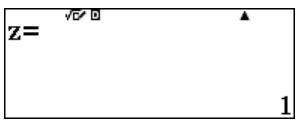
2nd insert coefficient one after another by pressing equal key

Steps to fill up the system:

[1] [=] [1] [=] [1] [=] [3] [=] [2] [=] [−] [1] [=] [4] [=] [8] [=] [0] [=] [1] [=] [1] [=] [1] [=] [=] [=] [=]



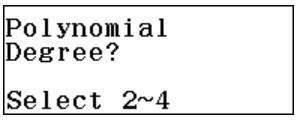




10) Solving Inequalities up to degree 4 :

Solving inequalities of degree 2

In order to solve inequalities log into inequalities mode from the main menu MENU ▫,,, then choose desired degree and desired inequality type.



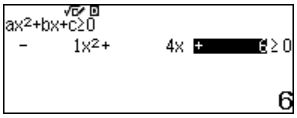
Example: solve the following inequality of degree 2

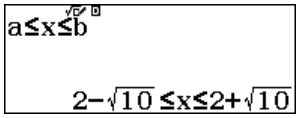
$-x^2 + 4x + 6 \geq 0$

Steps using calculator FX-991EX

1st log into inequalities and choose degree and desired inequality MENU ▫,,, 2 3

2nd input coefficients one after the other by pressing equal key (−) 1 = 4 = 6 =

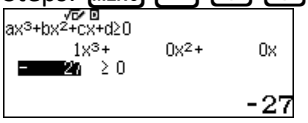




Example: $let\ f'(x) = x^3 - 27\ .construct\ table\ of\ variation$

1st solve inequality $x^3 - 27 \geq 0$

Steps: MENU ▫,,, 3 3 1 = 0 = 0 = (−) 2 7 =



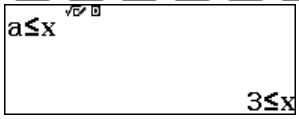


Table of Variation

		3	
$f'(x)$	-		+
$f(x)$	↘		↗

Example: For what values of $x, p(x) = \frac{x^2-4}{x^2-16}\ is\ positive.$

1st solve the numerator and denominator as separate inequalities

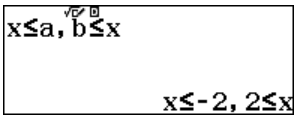
2nd construct table of signs

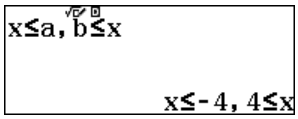
Procedure: solve $a)\ x^2 - 4 \geq 0\ and\ \ b)\ x^2 - 16 \geq 0$

Steps using calculator FX-991EX

a) $x^2 - 4 \geq 0$ MENU ▫,,, 2 3 1 = 0 = (−) 4 =

b) $x^2 - 16 \geq 0$ MENU ▫,,, 2 3 1 = 0 = (−) 1 6 =





After solving the 2 inequalities construct table of signs

		-4		-2		2		4	
$x^2 - 4$	+		+		-		+		+
$x^2 - 16$	+		-		-		-		+
$p(x)$	+		-		+		-		+

$p(x)\ is\ positive\ when$
$x \in (-\infty, -4) U (-2, 2) U (4, +\infty)$

11) Statistics

In order to solve statistics log into statistics from main menu [MENU] [6] and choose the type of your Statistics. In this session we will solve 1 variable statistics and 2 Variable (linear equation)

Example 1:

Rami got the following grades in Mathematics:

30,32, 35, 34, 36, 40, 32, 33, 36, 41, 44, 37,

Calculate the mean. Calculate the standard deviation

Steps using Calculator FX-991EX:

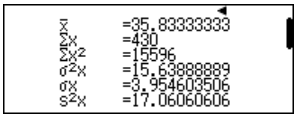
1st log into Statistics [MENU] [6]

2nd Choose 1- Variable [1]

3rd fill up the table

[3] [0] [=] [3] [2] [=] [3] [5] [=] [3] [4] [=] [3] [6] [=] [4] [0] [=] [3] [2] [=] [3] [3] [=] [3] [6] [=] [4] [1] [=] [4] [4] [=] [3] [7] [=] [AC]

4th click option key [OPTN] [2] for calculation.



A screen will show all calculations scroll down by arrow to see more result

Example 2:

The following table gives the distribution of students according to their weight:

Weight	30	31	32	33	34	35	36
Frequency	7	4	5	2	4	5	1

Calculate the mean, median, and standard deviation.

In this question insert frequency table:

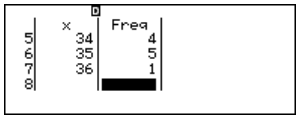
Steps using calculator:

1st log into statistic 1-variable [MENU] [6] [1]

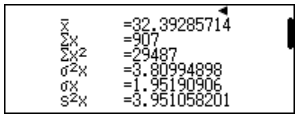
2nd activate frequency table [SHIFT] [MENU] [▼] [3] [1]

3rd input data

[3] [0] [=] [3] [1] [=] [3] [2] [=] [3] [3] [=] [3] [4] [=] [3] [5] [=] [3] [6] [=] [▶] [▲] [▲] [▲] [▲] [▲] [▲] [▲] [7] [=] [4] [=] [5] [=] [2] [=] [4] [=] [5] [=] [1] [=]



Click [AC] [OPTN] [2]



Example 3

The marks of 20 obtained on physics and mathematics test by 5 students of the same class are as follows:

Mark x in physics	7	10	11	13	16
Mark y in math	8	9	12	12	13

Write the regression linear equation D_y/x

This question deals with two variable statistics

If frequency table appears you can turn off frequency by:

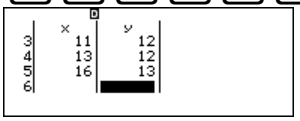
SHIFT MENU ▼ 3 2

<u>Steps using calculator FX-991EX</u>

1st log into statistics y=a+bx MENU 6 2

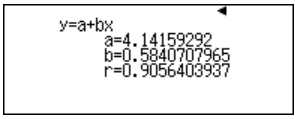
2nd input data

7 = 1 0 = 1 1 = 1 3 = 1 6 = ▶ ▲ ▲ ▲ ▲ ▲ 8 = 9 = 1 2 = 1 2 = 1 3 =



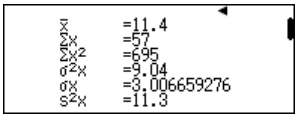
To find regression equation

AC OPTN 3



For 2 variable calculation

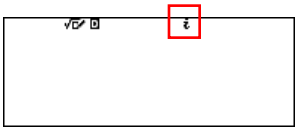
OPTN 2



12) Complex numbers

In order to solve problems with complex numbers, log into complex in main menu [MENU] [2]

Then an empty screen will appear with letter i on top



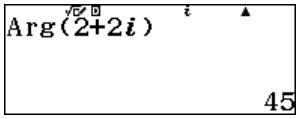
Example 1 :

$let\ z = 2 + 2i$

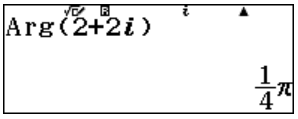
Find a) argument, b) conjucate,

a) Argument (the answer will appear in Degrees, if you want rsult in radian change angle unit from set up)

[OPTN] [1] [2] [+] [2] [ENG] [)] [=]

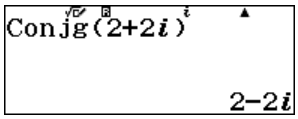


Argument in radians (change angle unit from setup [SHIFT] [MENU] [2] [2])



b) Conjugate

[OPTN] [2] [2] [+] [2] [ENG] [)] [=]

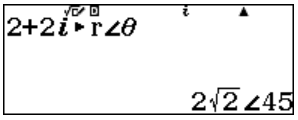


To reset calculator [SHIFT] [9] [3] [=] [=]

Example 2: (in this example angle unit is degrees)

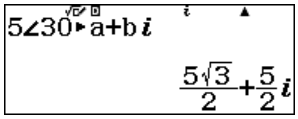
a) Convert $2 + 2i\ into\ polar\ form$

[2] [+] [2] [ENG] [OPTN] [▼] [1] [=]



b) $\theta = 30^o, r = 5\ to\ rectangular\ form$

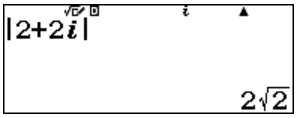
[5] [SHIFT] [ENG] [3] [0] [OPTN] [▼] [2] [=]



Example 3 :

Calculate modelus of $2 + 2i$

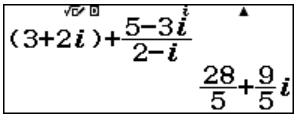
[SHIFT] [(] [2] [+] [2] [ENG] [=]



Example 4: operations and complex number

$$(3 + 2i) + \frac{5 - 3i}{2 - i} =$$

[(] [3] [+] [2] [ENG] [)] [+] [▭] [5] [−] [3] [ENG] [▼] [2] [−] [ENG] [=]

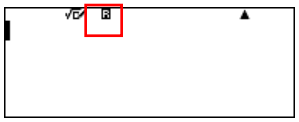


13) Angel Conversion

In order to convert angels for a given unit, log into [MENU] [1] calculation

Convert from Degrees to Radians:

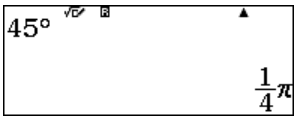
In order to convert from degrees to radians make sure that the calculator in Radian mode and "R" sign appears on the screen.



Setup calcualtor on Radian mode: [SHIFT] [MENU] [2] [2]

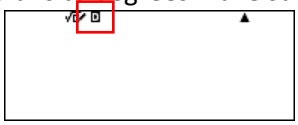
Example: convert $45^o \; to \; radians.$

Steps using calculator : [4] [5] [OPTN] [2] [1] [=]



Convert from Radians to Degrees:

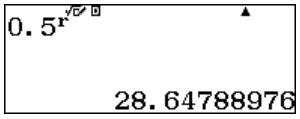
In order to convert from radians to degrees make sure that the calculator is on Degrees mode, and "D" sign appears on the screen.



Setup calculator on Degrees mode: [SHIFT] [MENU] [2] [1]

Example: convert 0.5 radians to degrees.

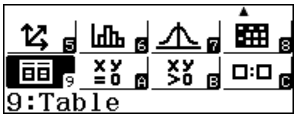
Steps using calculator: [0] [•] [5] [OPTN] [2] [2] [=]



14) Table

In order to use table using FX-991EX log into main menu screen and choose Table

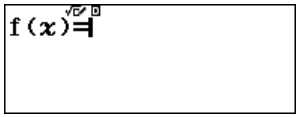
MENU 9

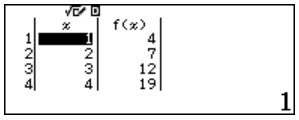


Example 1 : Check whether the function $f(x) = x^2 + 3$ is decreasing or increasing over the domain $x\epsilon(1,5)$.

Steps using calculator: Make sure the calculator is loged in to Table

x x^2 + 3 = = 1 = 5 = =



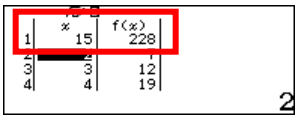


The table will show the result, now look at the f(x)

Values are they increasing or decreasing?

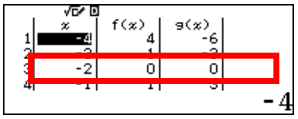
- To evaluate the function at any given "x"value, move the marked black space by arrow downword or upword in "x" column and replace it by any "x" value
  Example 2 : change the 1st "x" value by 15
  Steps :

  1 5 =



Example 3 : what is the intersection between the two given functions

$f(x) = x^2 + 4x + 4 \quad and \quad g(x) = 3x + 6 \ where \ -4 < x < 4$



Steps using calculator: make sure to be in the table mode MENU 9

x x^2 + 4 x + 4 = 3 x + 6 = − 4 = 4 = =

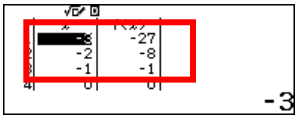
In order to locate the intersection point just check the table where $value \ f(x) = g(x)$

So the intersection point is (2,0)

Example 4: For what values of $x, f(x) = x^3 \ is \ negative \ , in \ the \ domain \ -3 \leq x \leq 3$

Steps using calculator: make sure table mode is activated MENU 9

x SHIFT x^2 = = − 3 = 3 = =

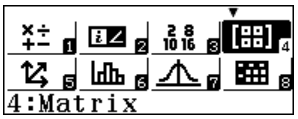


Check the negative values of f(x) from the table with respect to "x"

Domain where f(x) is negative : $x\epsilon[-3,0)$

15) Matrices

In order to log into matrices using FX-991 EX go main menu and click 4



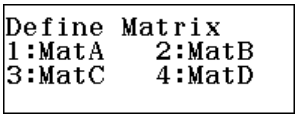
[MENU] [4]

Example: Given two matrices A and B

$A = \begin{matrix} 2 & 4 \\ 1 & 2 \end{matrix}$ $B = \begin{matrix} -2 & 3 \\ 0 & 5 \end{matrix}$

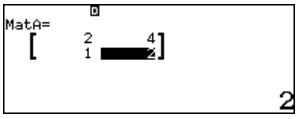
To insert the elemnts of the matrix in the calculator make sure to be loged in Matrix mode

A screen will appear showing 4 matrices



Define matrix A : steps using calculator

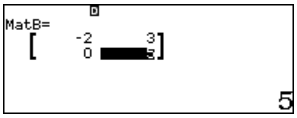
Choose dimention : [1] [2] [2]



Input elements: [2] [=] [4] [=] [1] [=] [2] [=]

Click [AC] [OPTN] [1] [2] to define Matrix B

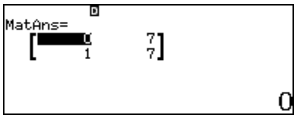
Define matrix B:



Dimension: [2] [2]

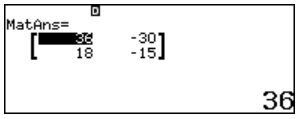
Insert elements: [(–)] [2] [=] [3] [=] [0] [=] [5] [=] [AC]

a) Calculate $Mat\ A + MatB$



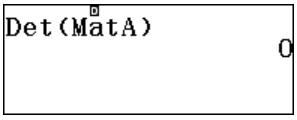
Steps using calculator: [OPTN] [3] [+] [OPTN] [4] [=]

b) Calculate $3Mat\ A \times (Mat\ A - MatB)$



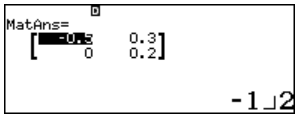
Steps: [3] [OPTN] [3] [×] [(] [OPTN] [3] [−] [OPTN] [4] [)] [=]

c) Calculate determinant of $Mat\ A$



Steps: [OPTN] [▼] [2] [OPTN] [3] [)] [=]

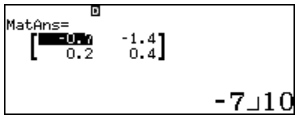
d) Find $inverse\ of\ Mat\ B$:



Steps: [OPTN] [4] [x^{-1}] [=]

e) $calculate\ a_{12}\ of\ Mat\ X\ such\ that\ \ BX = A$

Solution: $X = B^{-1} \times A$



Steps using calculator:

OPTN 4 x^{-1} × OPTN 3 =

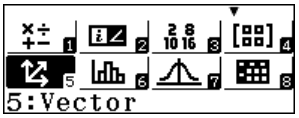
Then $a_{12} = -1.4$

When finished initialize calculator SHIFT 9 3 = AC

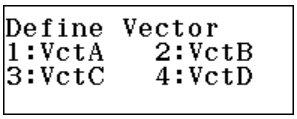
16) Vectors

In order to log into vector enter main menu then click 5

MENU 5



When logged in vector mode a screen will appear as follows:

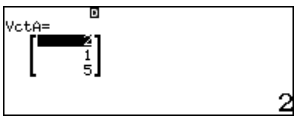


Example: Consider the two vectors

$$A = \begin{pmatrix} 2 \\ 1 \\ 5 \end{pmatrix} \; and \; B = \begin{pmatrix} -2 \\ 3 \\ 0 \end{pmatrix}$$

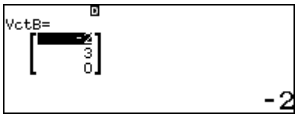
1st define each Vector:

- Define vector A : from the screen shown choose $Vct\ A$ 1
- Now define dimension: 3
- Input data: 2 = 1 = 5 = AC



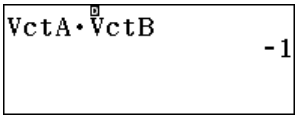
Define $Vct\ B$

- OPTN 1 2
- Define dimension 3
- input data (−) 2 = 3 = 0 = AC



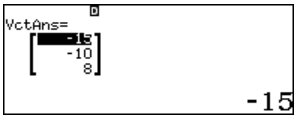
a) Calculate $Vct\ A \cdot Vct\ B$

Steps: OPTN 3 OPTN ▼ 2 OPTN 4 =



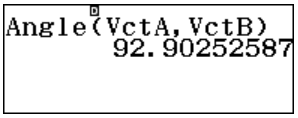
b) Calculate $Vct\ A \times Vct\ B$

Steps: OPTN 3 × OPTN 4 =



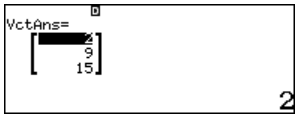
c) Find measure of angle θ between the two vectors

Steps: OPTN ▼ 3 OPTN 3 SHIFT) OPTN 4) =



d) Calculate $w = 3A + 2B$

Steps: 3 OPTN 3 + 2 OPTN 4 =



17) Derivative:

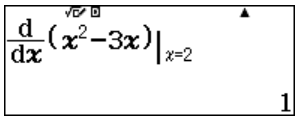
In order to work with derivative at a given point $f'(a)$. log into calculate MENU 1

Example: what is the equation of the tangent to the curve $y = x^2 - 3x \; at \; x = 2$?

1st slope $f'(2)$.

To calculate slope using calculator

SHIFT ∫ x x² − 3 x ▶ 2 =



Then slope =1

2nd equation of tangent

$$y - y_1 = a(x - x_1)$$

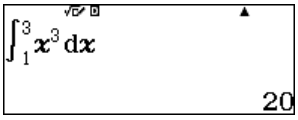
18) Definite Integral

To work with definite integrals log into calculate MENU 1

Example: calculate $\int_1^3 x^3 dx$

Using calculator:

∫ x x■ 3 ▼ 1 ▲ 3 =



19) Spreadsheet

To work with spreadsheet log into MENU 8

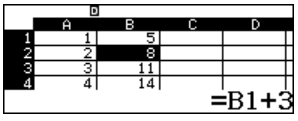
Example:

Find the 1st 5 terms in the nume6rical sequence $U_{n+1} = U_n + 3, such \; that \; U_1 = 5$

Using Calculator in spreadsheet mode:

Term	Value of Un
1	5
2	8
3	11
4	14
5	17

Term	Value of Un
1	5
=A1+1	=B1+3
=A2+1	=B2+3
=A3+1	=B3+3
=A4+1	=B4+3



Steps using Calculator:

To fill cells of Terms:

1 = OPTN 1 ALPHA (−) 1 + 1 =

▶ ▶ ▶ ▶ ▶ DEL 5 = =

To fill Value cells:

▶ 5 = OPTN 1 ALPHA ◦,,, 1 + 3

= ▶ ▶ ▶ ▶ ▶ ▶ ▶ DEL 5 = =