

# Graphical Times.

## Volume 17, Issue 63, 2017.



Welcome back to school for term 3, 2017! As the winter months take hold, we look forward to the daytime lengthening and nights shortening.

### What's in here!

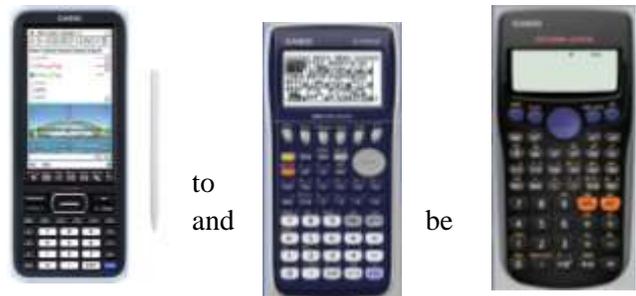
Included in this terms newsletter are calculator activities for the Classpad, graphic and scientific calculators:

- **Worksheet for the Classpad and similar models: Rearrange equations**
- **Worksheet for the FX9750GII and similar models: Calculus – the use of the derivative**
- **Worksheet for the FX82AU+II and similar models: Prime Factorisation**
- **Term 3, 2017 pricing: Valid for all of term 3, 2017.**

### Workshop opportunities

**Workshop opportunities:** If you would like to have a workshop for teachers and or students then please contact with *Graphic Technologies*. A large number of schools are taking up this opportunity either singularly or as a cluster of schools (with both the graphic calculator and the ClassPad), look at how the graphic calculator and CAS could impact on integrated into classroom practice.

With NZQA acknowledging that Year 11, 12 & 13 students without the use of a graphical calculator are being disadvantaged. A large number of schools have taking the opportunity to upskill teachers and students in using these mathematics/statistics hand-held and emulator classroom technologies.



### Worksheets downloaded off the web

Visit Monaco Corporation and Graphic Technologies websites to view and download worksheets and activities or past newsletters. There are links to other mathematics education websites too! For teachers we currently offer a large number of 'classroom ready' resources available and are designed primarily for the FX82AU, FX82AU+II, FX9750GII, FX9750G, FX9750G+, CFX9850GB, CFX9850GB+, CFX9850GC+, FX9750GA, FX9750GA+ and FX9750GII and the ClassPad300, 300+, 330A, 330A+ and the fx-CP400 series. More have been added to the website since the last newsletter. **Please visit:** [www.casio.edu.monacocorp.co.nz](http://www.casio.edu.monacocorp.co.nz) and <http://graphic-technologies.co.nz>

### Program to support the use of the FX82AU+II and FX9750GII

A reminder of the Casio Education NZ Top Schools Program which supports schools using the FX82AU+II and FX9750GII calculators. The goal for the programme is to have all senior students in New Zealand using a graphics calculator, so that no one is disadvantaged during NCEA examinations. Professional development courses are offered in conjunction with Graphic Technologies in supporting this initiative. Register now for 2018, if you have not already done so. Further details of the program can be uploaded from: [www.casio.edu.monacocorp.co.nz](http://www.casio.edu.monacocorp.co.nz)

### Mathematics and Statistics faculty circulation [Pass it on to . . . ]

	→		→		→		→		→		→
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### Classpad updates

The ClassPad II [fx-CP400] features a much larger, backlit screen than the previous models, while keeping the same functionality. Major differences for this handheld are the 3D graphing and presentation applications have been replaced by E-Con EA200 for data logging. Connectivity is much easier, and the ClassPad II acts as a USB drive when plugged into a PC. **eActivities** are a great way to store procedures. These can be downloaded and sent to the handheld model using the USB cabling (SB-67). Programs can be written and downloaded to extend the functionality of the ClassPad II. eActivities, files and programmes can also be transferred from calculator to calculator using the SB-62 cabling.

Online User manuals: <http://support.casio.com/manualfile.php?rgn=5&cid=004002012>

Visit: <http://www.classpad.com.au/index.html>

## Graphic Technologies Special Promotions

Some pricing specials for term 3, 2017.

Product	Price per unit (excl GST)
<a href="#">FX991ES</a> plus emulator software single licence	\$45.00
<a href="#">FX82A+II</a> emulator software single licence	\$45.00
<a href="#">FA-124USB</a> cable [high-speed data communication between PC and the FX9750GII] USB connectivity for file sharing	\$15.00
<b>Buy 10 FX9750Gii and receive one free FA-124USB cable</b>	

## Terms 2 & 3 2017 - Casio FX7400GII Promotion

The winning school is [YOUR SCHOOL NAME COULD BE HERE] will be receiving this randomly drawn prize in November, 2017. **Ten FX7400GII** and a **Carry Bag**. To go into the draw, schools need to purchase products totalling \$200 (excl GST) or more over the next 2 terms. Technical Details:

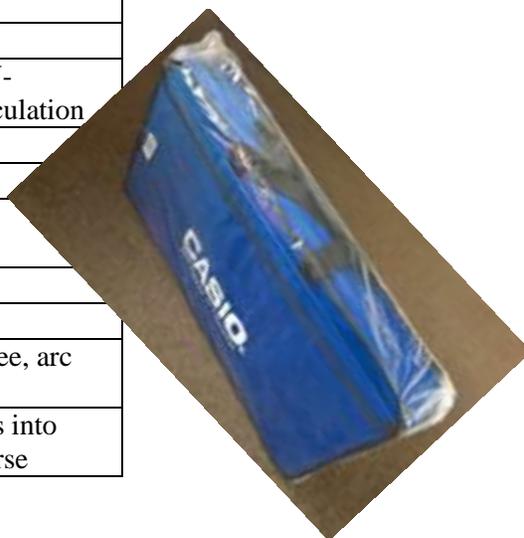
<b>Brand</b>	<b>Casio</b>
<b>Model Number</b>	<b>FX-7400GII-L-EH</b>
<b>Item Weight</b>	<b>159 g</b>
<b>Product Dimensions</b>	<b>16.3 x 8.2 x 1.9 cm</b>
<b>Batteries:</b>	<b>4 AAA batteries required. (included)</b>
<b>Lines Per Page</b>	<b>8</b>



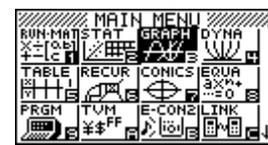
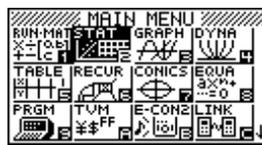
This new model will also win you over with its very high quality, and its range of more than 396 functions. The FX-7400GII has all the mathematical functions required for secondary school level.

The calculator also has a large display and is intuitive to use, featuring:

Extra large monochrome 8-line display	numerical integration
complex numbers	equation solving
integer solutions (graphic application and equation application)	zero of a function, min, max, Y-intercept, Y-calculation, X-calculation
random number integers	box and zoom function
large display (64 x 128 pixels)	random number generator
list data logic function and list-based statistics	greatest and lowest common denominator function
two-dimensional statistics	permutation, combinatorics
bar and pie charts	regression analysis
conversion of sexagesimal to decimal and inverse	calculations in centesimal degree, arc degree and radian
more graphs can be displayed in a coordinates system	conversion of polar coordinates into Cartesian coordinates and inverse



## FX9750GII Activities



## Plotting points in STAT mode and transferring to GRAPH mode.

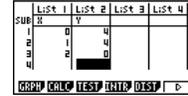
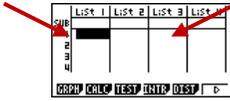
Select **STAT** mode from the **MAIN MENU** by using the arrow keys to highlight the **STAT** icon or pressing 2.

To select **GRAPH** mode, use the arrow keys to highlight the **GRAPH** icon or pressing 3.

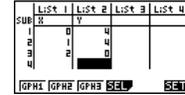
**Example:** Plot the following points: (0, 4) (1, 4) and (2, 0). Then fit a quadratic equation to these three points.

**Answer:** Type in the (x, y) co-ordinates in **STAT** mode with the x co-ordinates in 'list 1' and the y co-ordinates in the 'list 2' column.

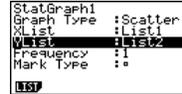
x co-ordinates                      y co-ordinates    Press **[EXE]** after each entry. Producing →



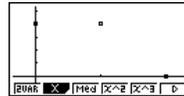
Now enter into **GRAPhING** by pressing **[F1]**, making sure that the statistical graph **GPH1** is set up as a **Scatterplot**.



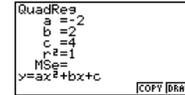
[Note: To do this enter **SET [F6]** and alter settings then **[EXIT]**.]



Press **[F1]** to draw **GPH1**.



Now select the graphical model, i.e. a quadratic by selecting **CALC [F1]** then **[F4]** to select the **X<sup>2</sup> [x^2]** model. This shows that the required equation that 'fit' through these three points is  $y = -2x^2 + 2x + 4$ .



[Note: **[F6]** will draw the graph of the selected mathematical model.]

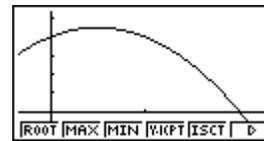
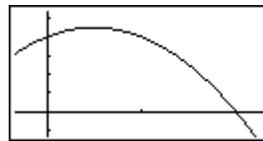
**BUT** . . . we want to transfer this equation to the **GRAPH** icon, so that all of the G-Solv options are available to scrutinise about the equation and graph.

So, select **[F5]** to **COPY**.

i.e. from the Statistics area to here (Graphing area). Now press **[EXE]**.



Now press **[MENU]** to return to the **MAIN MENU** and enter into the **GRAPH** icon, where you have access to G-Solve features after the graph has been drawn.



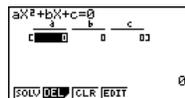
## Solving Polynomial Equations

Use the calculator in **EQUA** mode.

The calculator can solve quadratic and cubic equations in the form, in fact polynomial equations up to degree 6!



A quadratic equation:  $ax^2 + bx + c = 0$



A cubic equation:  $ax^3 + bx^2 + cx + d = 0$

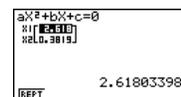
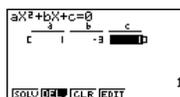
$ax^3 + bx^2 + cx + d = 0$



**Example 1:** Solve  $x^2 - 3x + 1 = 0$

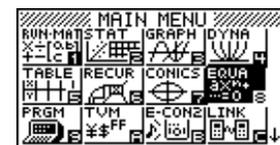
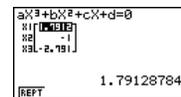
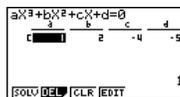
**Answer:** Enter the coefficients of the equations, pressing **[EXE]** after each entry.

Press the **[F1]** key to solve the equations.



**Example 2:** Solve  $x^3 + 2x^2 - 4x - 5 = 0$

**Answer:** Enter the coefficients of the equations.



Press the **[F1]** key to solve the equations.

## Simultaneous Equations

3 Equations – 3 unknowns

The calculator can solve systems of equations in the form:

$$ax + by + cz = d$$

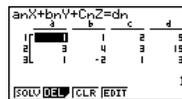
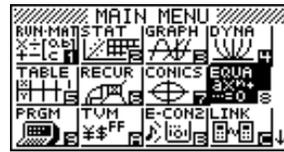
$$ex + fy + gz = h$$

$$ix + jy + kz = l$$

Use the calculator in **EQUA** mode. Enter Simultaneous using **[F1]** then **[F2]** for 3 equations.

**Example:** Solve  $x + y + 2z = 9$   
 $3x + 4y + 3z = 19$   
 $x - 2y + z = 3$

**Answer:** Enter the coefficients of the equations.  
 Press **[F1]** to solve the equations.



## Useful websites

<https://www.learner.org/courses/againstallodds/>

A series of Statistical videos

<https://www.geogebra.org/search/perform/search/Freeze%20patterns>

Freeze patterns

<https://www.youtube.com/watch?v=NoRjwZomUK0>

Squared Squares

<https://www.youtube.com/watch?v=wA5HO-VIv5M>

Twin Primes Problem

<https://www.geogebra.org/m/HsDfUjt9>

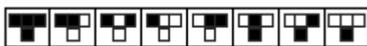
Moiré patterns appear in many different situations.

<https://youtu.be/aeYhnrZvQBE>

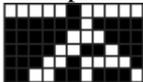
Cambridge North is a brand new train station, and the building's got a new exterior cladding with a design 'derived from John Horton Conway's "Game of Life" theories.

<http://atlas.wolfram.com/01/01/135/>

Rule 135



Example:



## A last word!

Well again, that's all I can fit onto the 4 pages! Enjoy term 3! Hope to see you at some workshops or hear from you! If you would like to contribute or have suggestions as to what you would like to have discussed via this medium, please do not hesitate to contact us either by snail-mail, email, website, telephone, text or fax.

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