Graphical Times.
Volume 19, Issue 70, 2019.

Welcome back to the new term. We hope that you have had a good
term break and enjoyed time with whanau over the Easter and ANZAC break. Please support NZAMT16

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: Finite and infinite series**
- **Worksheet for the FX9750GII and similar models: Graphing two equations and finding the intersection points.**
- **Worksheet for the FX82AU+II and similar models: Polar and Rectangular**
- **Term 2, 2019 pricing valid until 29th July 2019.**

Workshop opportunities

Workshop opportunities: If you would like to have a workshop for teachers and/or students then please make 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 and ClassPad calculators), to look at how these technologies calculator could impact on and be integrated into classroom practice. With NZQA acknowledging that Year 11, 12 & 13 students without the use of a graphical calculator are being disadvantaged in the external examinations. A large number of schools have taking the opportunity to upskill teachers and students in using these mathematical and statistical hand-held and emulator 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 CASIO® 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 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 in the mathematics and statistics external NCEA examinations. Professional development courses are offered in conjunction with Graphic Technologies in supporting this initiative. Register now for 2020, if you have not already done so.

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

	→		→		→		→		→		→
	→		→		→		→		→		→

Further details of the program can be uploaded from: www.casio.edu.monacocorp.co.nz or
http://casio.edu.monacocorp.co.nz/graphic_school_program.php and
http://casio.edu.monacocorp.co.nz/top_school_program.php

Classpad updates

The ClassPad [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. The **eActivities** are a great way to store procedures and activities. These can be downloaded and sent from the handheld ClassPad to another handheld ClassPad 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.
Visit: http://www.classpad.com.au/index.html

Graphic Technologies Special Promotions

Some pricing specials for term 2, 2019 until 19/7/2019. See the separate price sheet for more information on models.

Product	Price per unit until the end of TERM 2, 2019 (exclusive GST)
FX9750GII graphic calculator (monochrome) RRP $169.00	$105.00
Buy in multiples of 10 FX9750Gii and receive one free FA-124 USB cable Special price for term 2, 2019	$1050.00
FX82AU+II scientific calculator RRP $39.99	$27.00
FX-CG20 graphic calculator (colour)	$220.00
Class Wiz series FX570EX	$59.00
Class Wiz series FX991EX	$69.00
Class Wiz series FX82EX	$37.00
Class Wiz series FX350EX	$39.00

Useful websites

https://brilliant.org/
https://www.youcubed.org/resource/in-the-news/
https://education.nzta.govt.nz/teacher-resources/
https://education.nzta.govt.nz/teacher-resources/secondary-curriculum-resources/mathematics-and-statistics/
http://www.mrbartonmaths.com/index.html
https://www.youcubed.org/ A large number of dropdowns to select from
https://www.youtube.com/watch?v=hiiEeMN7vbQ Developing a Growth Mindset with Carol Dweck
https://grapher.jake4maths.com/
https://www.mathsnz.com/resources/
https://lite.docker.stat.auckland.ac.nz/ **inzight** lite is an online version of the software, which requires only access to the internet and a modern web browser.
https://www.stat.auckland.ac.nz/~wild/iNZight/ The desktop application **inzight** is a simple data analysis system which was initially designed for high school students to help them explore data.

Activities

Graph drawing – Zooming in and out.

Select **GRAPH** mode from the main menu by using the arrow keys to highlight the **GRAPH** icon or pressing [**3**].
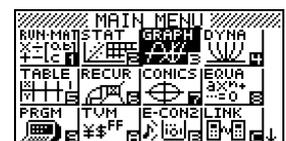
Set up the V-Window to either **INIT** (initial) or **STD** (standard).
Press **[SHIFT] [F3]** then either **[F1]** for **INIT** or **[F3]** for **STD**.
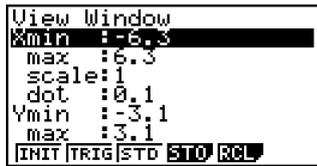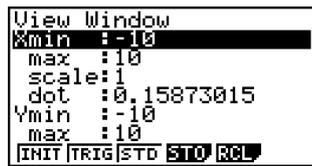
Initial   **Standard**

<u>Example:</u>   Draw $y = x^2 + 3x + 2$

<u>Answer:</u>   Type in the equation and then F6 to draw.
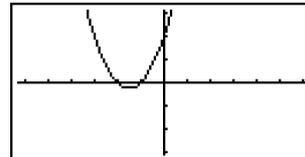
Make sure that the **V-Window** (Graph Viewing Window) has been set up for the graph type that you want to see.
N.B. You can use the **AUTO ZOOM**, this is where the calculator will adjust the axes so that you can see the graph better, then adjust the **V-Window** to a more appropriate scale to suit what you want.

To get **AUTO ZOOM** press **[SHIFT] [F2]** then **[F5]**.
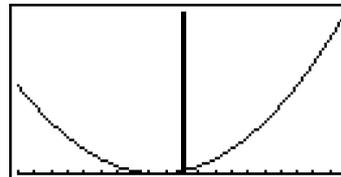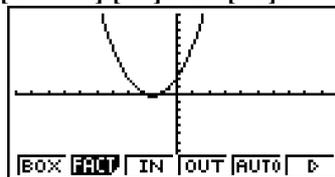
The most important viewing windows are:
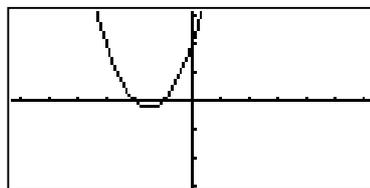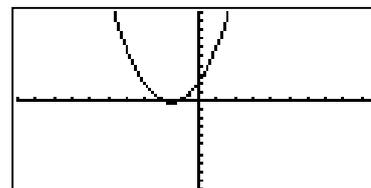
Initial SETTING **[F1]**   **ST**an**D**ard SETTING **[F3]**

and for the Trigomometrical graphs, select **TRIG** SETTING **[F2]**
There are two setting here that are used most often, depending what angular measure you are in.
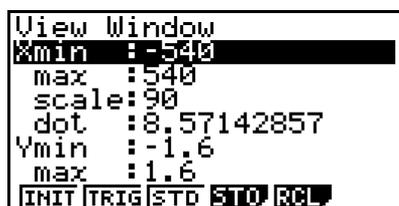
Degree setting   **OR**   **Radian setting**

To change between the Degree and radian settings press **[SHIFT] [MENU]** for **SETUP**.

Select **[F1]** for **Deg**ree and **[F2]** for **Rad**ian.
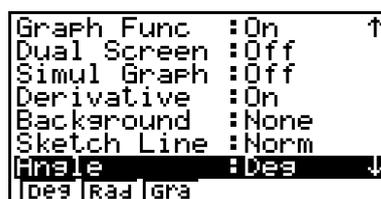
N.B. The more graphs that you experience drawing on the graphical calculator the more familiar you will get with understanding the relationship between the graphs and their equations that are represented algebraically.

Algebraic substitution – numeric.

Select **RUN** mode from the main menu by using the arrow keys to highlight the **RUN** icon or pressing [**1**].

> *Introduction:*   Algebraic substitution is where an independent numerical variable, usually x, is substituted into an equation for a dependent variable, usually y.
>
> *Hints:* To have '?' and ':' statements, the menu trail is: [**SHIFT**] [**VARS**] [**F4**]
>
> [**SHIFT**] [**VARS**], then [**F4**] for the '**?**' and [**SHIFT**] [**VARS**] then [**F6**] followed by [**F5**] for the '**:**'.
>
>

Example 1:   Calculate the value of the following when x = -2, 0, 2 and 4, in the expression $2x^2 + 4x - 1$.

Answer: Type in ? → x: $2x^2 + 4x - 1$

Then press [**EXE**] to initiate this expression.
A '**?**' will display, this is the calculators way of saying, "Enter in a number."

Enter in -2, then press [**EXE**] the answer -1 is displayed, the calculator has done this:

$2\times(-2)^2 + 4\times (-2) - 1 = -1$

Press [**EXE**] again, this brings up the '**?**' again, type in 0 and press [**EXE**] and repeat the above sequence, calculating the expression of $2x^2 + 4x - 1$ for each of the x-values required.
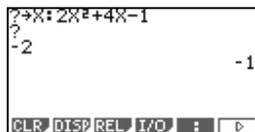
Example 2:   Calculate the **f′(x)** values of the following, when x = -2, 0, 2 and 4, expression given by f(x) = $2x^2 + 4x - 1$.

Answer: Type in ? → x: d/dx($2x^2 + 4x - 1$,x) and repeat the process explained in example 1.
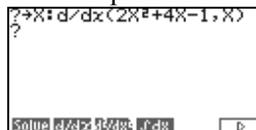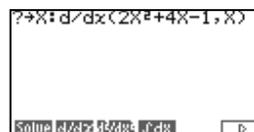
[Note: Differentiation d/dx is [**SHIFT**] [**OPTN**] [**F4**] (CALC)]

A last word!

Well again, that's all I can fit onto the 4 pages! Enjoy term 2! 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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