Graphical Times.
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GRAPHIC TECHNOLOGIES

Welcome back to school for term 2, 2017!

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: Drag and Drop between applications**
- **Worksheet for the FX9750GII and similar models: Converting between Polar / Rectangular form**
- **Worksheet for the FX82AU+II and similar models: Hooke's law**
- **Term 1, 2017 pricing: Valid for the rest of term 2, 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), to look at how the graphic calculator and CAS could impact on and be integrated into classroom practice. With NZQA acknowledging that Year 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 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 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

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

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

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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 for term 2, 2017

Some pricing specials, valid until the end of June, 2017.

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

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:

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

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

FX9750GII Activities

1. A line - multiple representations for y = mx + c [different gradients]

Select GRAPH mode from the **MAIN MENU** by using the arrow keys to highlight the
**GRAPH** icon or pressing 3.

Showing how the graphic calculator can be used to draw multiple lines, use it to see the
relationship to the change in the gradient 'm' in y = mx + c.

Open the GRAPH-window, and make sure that the V-Window is appropriate to see the graphs
that you will be drawing.

Change the settings to the conditions shown here. [**SHIFT**] [**F3**].

Now, the [**EXIT**] or [**EXE**] key to go back to the *Graph Function* window.

Using ,[A=1,2,3] at the end if the equation gives the effect of a 'dynamic graph'.
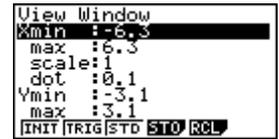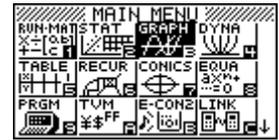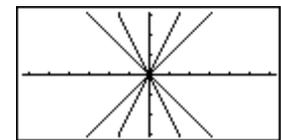
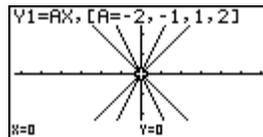**Example 1:**   Draw the graphs of $y = -2x$, $y = -1x$, $y = 1x$, $y = 2x$

Answer: **Type in AX,[A=-2,-1,1,2] into the 'Y1 space'**

Press [**EXE**] to store this equation
Press [**EXE**] or [**F6**] to draw the graphs. You will see the lines being drawn
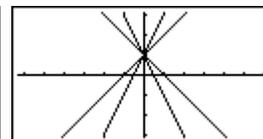one at a time.

To 'trace' the lines, use **Trace** [**SHIFT**] [**F1**] and the ↓ or ↑ or → or ←
arrows to trace either of the 4   graphs:
$y = -2x$, $y = -1x$, $y = 1x$, $y = 2x$

Example 2:   Draw the graphs of $y = -2x + 1$, $y = -1x + 1$, $y = 1x + 1$, $y = 2x + 1$
Answer: **Type in AX+1,[A=-2,-1,1,2] into the 'Y1 space' and repeat the steps shown in Example 1 above.**

2. A line- multiple representations for y = x + c [different y-intercepts]

Showing how the graphic calculator can be used to draw multiple lines, use it to see the relationship to the change in the
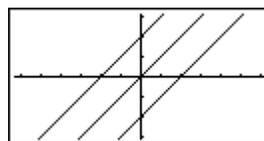constant 'c' in y = mx + c.

Using ,[A=-2,0,2] at the end if the equation gives the effect of a 'dynamic graph'.

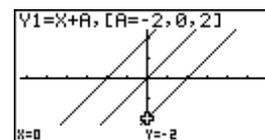**Example:** Draw the graphs of $y = x - 2$, $y = x$, $y = x + 2$

Answer: **Type in X+A,[A=-2,0,2] into the 'Y1 space'**
Press [**EXE**] to store this equation

Press [**EXE**] or [**F6**] to draw the graphs. You will
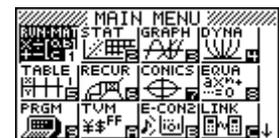see the lines being drawn one at a time.

To 'trace' the graphs use **Trace [SHIFT] [F1]**.
and the ↓ or ↑ or → or ← arrows to trace either of the 3 graphs.
$y = x - 2$, $y = x$, $y = x + 2$

3. Algebraic substitution - numerical

Select **RUN-MAT** mode from the **MAIN MENU** by using the arrow keys to highlight the
RUN-MAT icon and pressing [**EXE**] or [**1**].

Showing how the graphic calculator can be used to substitute numerical values into algebraic expressions. 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]**, 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:2x² + 4x – 1**

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

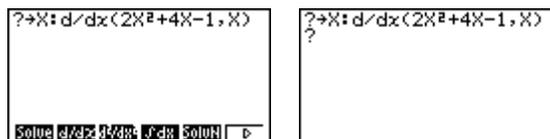Enter in -2, then press **[EXE]** the answer -1 is displayed, the calculator has done this:

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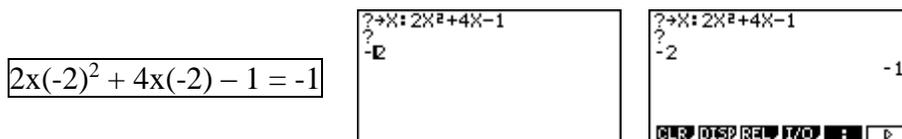
Press **[EXE]** again, this brings up the '**?**' again, type in 0 and press **[EXE]** and repeat the above sequence, calculating the expression of $2x^2 + 4x – 1$ for each of the x-values required.

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(2x² + 4x – 1,x) and repeat the process explained in example 1.

[**Note:** For differentiation, d/dx is **[SHIFT] [OPTN] [F4]** (CALC)]

Useful websites

https://edu.casio.com/education/activity/
http://wwwstaff.murdoch.edu.au/~kissane/papers/MAV04.pdf
http://wwwstaff.murdoch.edu.au/~kissane/papers/AAMT05.pdf
https://quickdraw.withgoogle.com/
https://www.symbolab.com/solver/definite-integral-calculator
http://www.rapidtables.com/math/symbols/Geometry_Symbols.htm

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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