Graphical Times.
Volume 17, Issue 61, 2017.

Welcome back to school for term 1, 2017! We hope the summer break gave you the opportunity for it to be a restful one. In this issue, there are 'Back to School' offers (ending 28th February), see pricing. Note that Casio Japan has increased the wholesale cost per unit late in 2016 and this unfortunately has to be passed on to the NZ consumer. Graphic Technologies will always provide very competitive pricing throughout the year. All the best for this busy Summer ~ Autumn term to you and your students.

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: Using the 'Algebra assistant'**
- **Worksheet for the FX9750GII and similar models: Quadratics and Pythagorean Triples**
- **Worksheet for the FX82AU+II and similar models: Natural #'s, Square #'s and Pythagorean Triples**
- **Back to School Pricing 2017: Valid until the end of February, 2017**
- **Term 1, 2017 pricing: Valid from 1st March, 2017 and for the rest of term 1, 2017.**

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 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 upskilling 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 sseries. 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

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

	→		→		→		→		→		→
	→		→		→		→		→		→

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 2017 and 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 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 'Back to School'

Some pricing specials, valid until the end of February, 2017, while stocks last.

Product	Price per unit (excl GST)
FX9750GII graphic calculator (monochrome) RRP $159.95	$80.00
FX82AU+II scientific calculator RRP $39.95	$19.00
AAA Batteries Card of 4 (Minimum 12 cards (48) an order)	$5.00
AA Batteries Card of 4 (Minimum 12 cards (48) an order)	$5.00
Back up battery CR2032 [for graphic calculator]	$2.00

FX9750GII Activities

1. **Order of operations on the graphic calculator:**

Please be wary of the order of operations and priority settings for the FX9750GII, particularly when using square roots and no multiplication sign between variables and constants.

The graphic calculator employs true algebraic logic to calculate the parts of a formula in the following orders:

• Coordinate transformation e.g. Pol(, Rec(

• Functions that include parentheses (such as derivatives and integrations)

d/dx and d^2/dx^2, Median, Mean, Augment, Mat List, P(, Q(, R(, t(, RndFix, log

• Composite functions

$x, x^2, x!, x^{-1}$, ° ' ", ENG symbols, angle unit °, y, Power/root ^( ), Fractions $a^b/_c$

Abbreviated multiplication format in front of a memory or variable name e.g. 5A, Xmin, F Start, etc.

• Other:

log, ln, ( ), Solve, FMin, FMax, List Mat, Fill, Seq, SortA, SortD, Min, Max, List, Mat, fn, Yn, rn, Xtn, Ytn, Xn, e^, 10^x, sin, cos, tan, sin

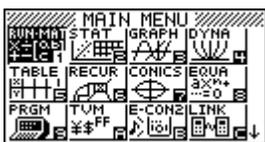• Operations:

Permutation, combination, Metric conversion commands, ÷, Int÷, Rnd, +, −, Relational operators =, >, <, And (logical operator), and (bitwise operator),Or, Xor (logical operator), or, xor, xnor.

• **Note:** Anything contained within parentheses receives the highest priority.

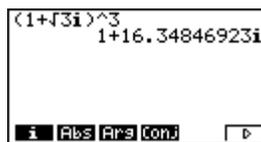**A be careful example:** Simplify the complex number: $(1 + \sqrt{3}i)^3$.

Solution: Enter $(1 + \sqrt{3} \times i)$^3

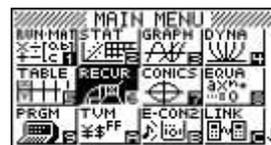| Main Menu | **OPTN** then [**F3**] | Incorrect: $(1 + \sqrt{3}i)$^3 | Correct: $(1 + \sqrt{3} \times i)$^3 |

2. Sequence and series

Select **RECUR** icon or pressing **6** from the **MAIN MENU**.

You will get the following screen:
This is the calculators default setting.
(See screen shot.)

Note: There are 3 different settings for recursive formulas.
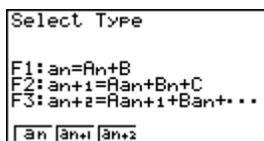
Type 1   **Type 2**   **Type 3**

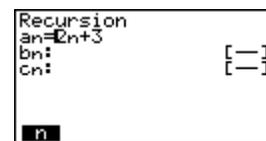Push [**F3**] for 'TYPE':   Then [**F1**] for Type 1:

Example:
Find the first 10 terms of the sequence $< an > = < 2n + 3 >$
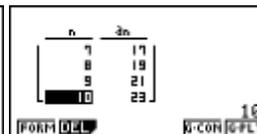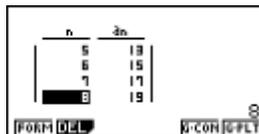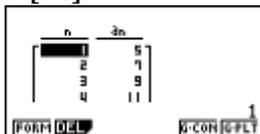**Note:** n is entered by pressing [**F1**]

Answer:
Type in: $2n + 3$ then set up the range of values, [**F5**] **SET**, for n
from $n = 1$ to $n = 10$:

by selecting, [**F5**] for **TABL**e and typing **1** then [**EXE**], **10** then [**EXE**], and [**EXIT**].

Selecting **TABL**e [**F6**].

By scrolling down you can see the remaining values of the sequence.
Giving the answer $< a_n > = < 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, \ldots >$

Note: A third column can be set up and displays the series, $\sum a_n$, this is accessed through **SET UP,** via [**SHIFT**]
[MENU] and adjusting the appropriate settings for Sigma $(\sum)$ display. The sigma display can be used for both arithmetic
and geometric series.

Turn the display **'ON'** or **'OFF'**, using either [**F1**] or [**F2**]then
[**EXIT**].
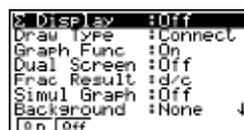
Example: Find the sum of the first 10 members of the sequence
$< a_n > = < n + 2 >$

Answer: Enter in the expression of the sequence, $n + 2$.
Press [**EXE**] to store it.

Then press **[F5]** to set up the calculator to calculate the first 10 members of the sequence. Then **[EXIT]**

```
Table Setting   n
Start:1
End  :10
```

Then **[F6]** for the **TABL**e, to reveal the sequence shown below.

Giving the answer < ∑a₁~₁₀ > = 75

If you want to draw the sequence (or series) make sure that you have set up the V-Window (*x* and *y* axes) to adequately draw and display these on the screen. V-Window is accessed via **[SHIFT] [F3]**.
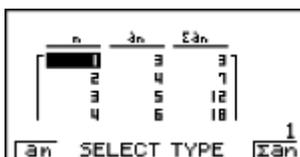
For the sequence:

```
View Window
Xmin :0
 max :11
 scale:1
 dot  :0.08730158
Ymin :0
 max  :15
```

For the series:

```
View Window
Xmin :0
 max :11
 scale:1
 dot  :0.08730158
Ymin :0
 max  :80
INIT TRIG STD STO RCL
```
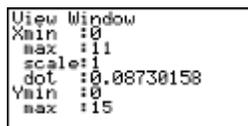
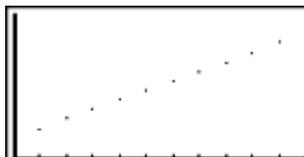**[EXIT]** then **[F6]** to get the table again. Generate the values by pressing **[F6].**
Then **[F6]** to G-Plot.
You will be greeted with a choice of what you want to plot the original sequence or the series (∑). Either **[F1] or [F6]** for either the plotted sequence or series values to be displayed.
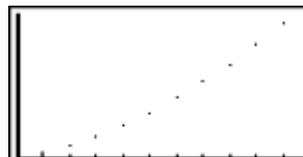

F1   **F6**   For the sequence.   For the series.

Online User manual: http://support.casio.com/manualfile.php?rgn=5&cid=004002013

Useful websites
http://figurethis.nctm.org/ NCTM - Figure This! Math Challenges for Families - Challenge Index
http://www.inquirymaths.com/ **Inquiry Maths** is a model of teaching that encourages students to regulate their own activity while exploring a mathematical statement (called a prompt). Inquiries can involve a class on diverse paths of exploration or in listening to a teacher's explanation. In Inquiry Maths, students take responsibility for directing the lesson with the teacher acting as the arbiter of legitimate mathematical activity.
http://www3.ul.ie/~rynnet/swconics/practical_applications1.htm Conic sections – practical applications ...

A last word!
Well again, that's all I can fit onto the 4 pages! Enjoy term 1! 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.

Derek Smith   **Phone: 04 569 1686**
Graphic Technologies   **Fax: 04 569 1687**
73 Viewmont Drive   **Mobile: 027 460 2871**
Lower Hutt 5010   **Website: http://graphic-technologies.co.nz**
                              Email: graph.tech@xtra.co.nz

"Proud sponsors of Maths Education in New Zealand"