

Graphical Times.

Volume 11, Issue 41, 2012.



Welcome back to the start of 2012! We hope you have had a restful summer break, read a few non-mathematical/statistical books and are rearing to go!

What's in here!

Included in this terms newsletter is:

Calculator activities for the Classpad 330+ and Casio graphic calculator

- Worksheet for the Classpad 330+ and similar models: What is all this fuss about pi?
- Worksheets for the FX9750GII and similar models: LCM and GCD in RUN-MAT mode.
- Worksheets for the FX82AU: Rounding Decimals.

'Back to School' pricing list. Valid until 29th February 2012, while stocks last.

Term 1, 2012 pricing list. Valid from 1st March 2012, while stocks last.

N.B. The 2012 Graphic Technologies Catalogue is available on request.

Please email us: graph.tech@xtra.co.nz to receive your free copy.

Graphic Technologies School 'Back to School' pricing until 28th February 2012.

See our **hot competitive pricing** valid until the end of February 2012.

[See the pricing sheet for more products.](#)

Product	# of Units	Price per unit (excl GST)
FX9750GII graphic calculator (monochrome) RRP \$129.95	1 - 10	\$79.50
	11 - 19	\$78.00
	20 +	\$75.50
Data projector XJA130 New pricing [Limited supply]	NA	\$1425.00
Data projector XJA145 New pricing [Limited supply]	NA	\$2000.00
FX82 AU scientific calculator	1 - 9	\$20.00
FX82 AU scientific calculator	10 +	\$19.00



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 ClassPad330+, to look at how the graphic calculator and CAS could impact on and be integrated into your classroom practices. With NZQA having acknowledged that year 12 & 13 students without a graphical calculator are disadvantaged, a large number of schools are taking up the opportunity to upskill teachers and students on this piece of mathematics/statistics technology.

The FX82AU+

Top Schools programme – This programme is for those schools who wish to support and booklist the FX82AU. School whom are part of this will get ongoing resources and learning material along with the following when they first sign up:

- 3 × FX82AUPLUS calculators
- FX82AUPLUS Emulator software
- Teacher Book "How do I ...on a CASIO FX82AU plus"

Mathematics Department Cycle [Pass it on to . . .]

	→		→		→		→		→	
	→		→		→		→		→	



- d. Classroom posters of the FX82AUPLUS calculator
- e. Teaching resources.

The website will be www.casio.edu.monacocorp.co.nz. The following is a general idea of what will be included:

- a. Full specifications on our range
- b. Worksheets for all models – especially the FX9750Gii
- c. Re-sellers of CASIO calculators
- d. FAQ's
- e. Online booking system for any workshops (Workshops we have listed or requesting a workshop).

Please visit the Casio NZ Education Website at www.casio.edu.monacocorp.co.nz

Brochure on the FX82AU: http://graphic-technologies.co.nz/doc/FX82AU_Brochure.pdf

Program to support use of FX9750Gii

In 2011 Casio Education NZ launched the 'Top Schools Program' to support schools using the new model of FX82AUplus scientific calculator. Registration numbers and general feedback indicated that the resources provided were of great benefit, so Casio Education NZ is launching a similar program in 2012 to support schools currently using (or wanting to use) the FX9750Gii Graphic Calculator. Details will be revealed later in term 1, so look out for an information pack in the post. The goal is to have all senior students using a graphics calculator so that none are disadvantaged during examinations. Professional development courses offered in conjunction with Graphic Technologies will support the program which looks to offer a sample calculator and comprehensive 'How to get started on your FX9750Gii' instructional manual. Details of the program will be uploaded to www.casio.edu.monacocorp.co.nz once confirmed.

JOIN THE TOP SCHOOLS PROGRAM TODAY!

Worksheets downloaded off the web.

Visit Monaco Corporation or Graphic Technologies website to view and download worksheets. There are links to other informative 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, FX9750Gii, FX9750G, FX9750G+, CFX9850GB, CFX9850GB+, CFX9850GC+, FX9750GA+ and FX9750Gii models of graphical calculators and the ALGEBRA 2.0. There is also a variety of activity sheets designed for the ClassPad300, 300+, 330A and 330A+ models. All of the activities and worksheets are designed for beginners to advanced users of the GC and CAS. More have been added to the website since the last newsletter.

Visit: www.casio.edu.monacocorp.co.nz and <http://graphic-technologies.co.nz>.

Websites of interest...

Here is the link for the box and whisker graphs

<http://www.imathas.com/stattools/boxplot.html>

Some units of work based on the FX9860GAU

http://www.casio.edu.shriro.com.au/cr_fx9860gau_runits.php

http://www.casio.edu.shriro.com.au/cr_fx9860gau.php

$1 + 2 = 2$

<http://www.cs.tut.fi/~bregovic/ieee.pdf>

The following files from the 2011 Statistics Teachers' Day organised by the Auckland Mathematical Association and The University of Auckland's Department of Statistics have been put up on the Census At School's website:

<http://www.censusatschool.org.nz/2011/statistics-teachers-day-years-12-and-13/>

- Death of the Normal Distribution: Resampling (Bootstrapping), Randomisation and More Auckland Mathematical Association and Statistics Department, University of Auckland
- Star Trek Inference Tour: From taking samples to bootstrap and randomisation inference at light speed Professor Chris Wild, Statistics Department, University of Auckland
- Bootstrapping and Randomisation
- Questionnaire design (Achievement Standard 2.8: Design a questionnaire) Anna Martin and Jacob Le Roux, Avondale College
- Teaching activities towards Achievement Standard 2.9: Use statistical methods to make an inference:

Handouts and Data Files - Lindsay Smith, University of Auckland

- A brief introduction to experimental design (Relates to AS 2.10) James Curran, University of Auckland
- Talk Back to Statistics: Statistical literacy skills in Achievement Standard 2.11 (Evaluate a statistically based report) Rachel Passmore, St Kentigern College
- Risk (Relates to part of AS 2.12) Thomas Lumley, University of Auckland
- A new world of simulations: Games Suitable for Simulations and Other Handouts Marion Steel, Epsom Girls Grammar School
- Probability: risk-free Lars Thomsen, Avondale College
- Genstat for Year 11 and 13 Statistical Analysis Jeanette Chapman, Otago Girls' High School.

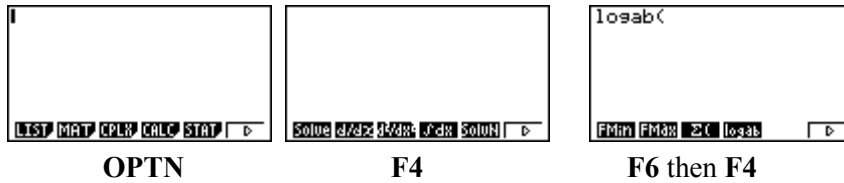
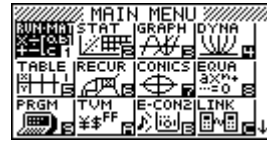
Classpad update.

http://www.casio.edu.shriro.com.au/cr_classpad_corner.php

Some features of the FX9750Gii explored

log_ab (in RUN-MAT)

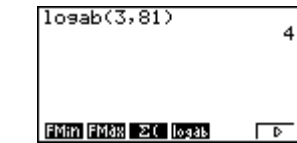
This is seen as: log_a b



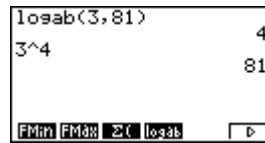
OPTN

F4

F6 then F4



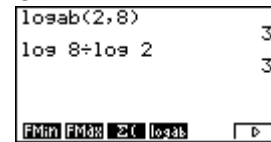
$\log_3 81 = 4$



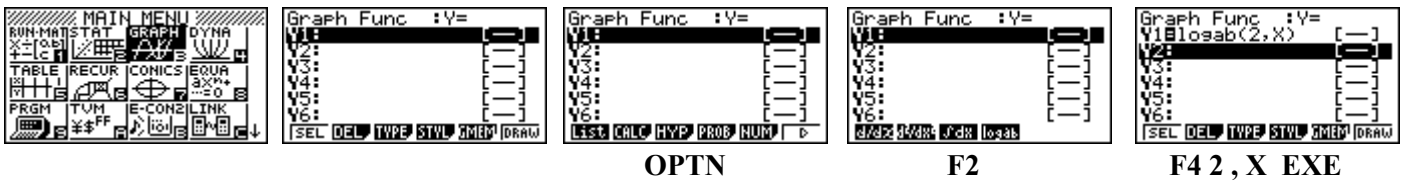
The equivalent mathematical statement to $\log_3 81 = 4$ is $3^4 = 81$.

Note: $\log_{10} 81 / \log_{10} 3 = 4$ or $\log_{10} 8 / \log_{10} 2 = 3$

In general: $\log_{10} b / \log_{10} a = \log_a b$



log_ab (in GRAPH)

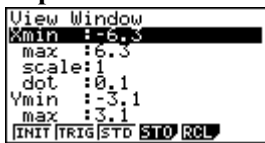


OPTN

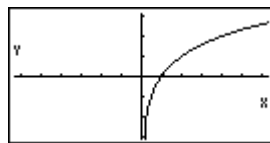
F2

F4 2, X EXE

Set up the V-Window

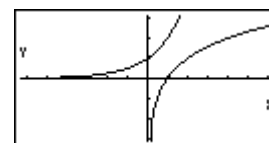
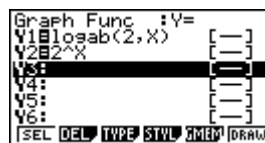


SHIFT F3 F1 EXIT

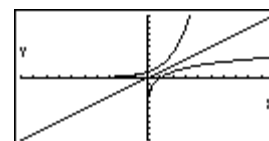


F6 to DRAW

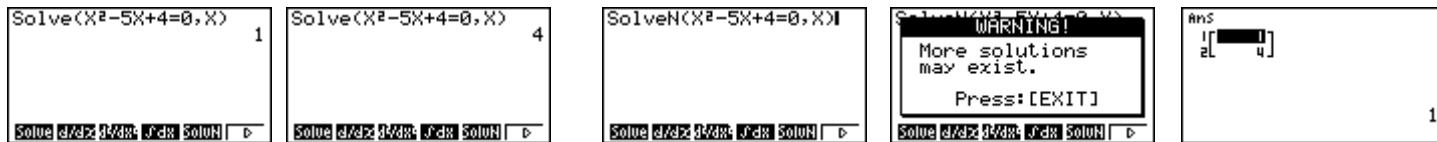
Inverse functions: $y = 2^x$ and $y = \log_2 x$



Note the reflective symmetry in the line $y = x$.



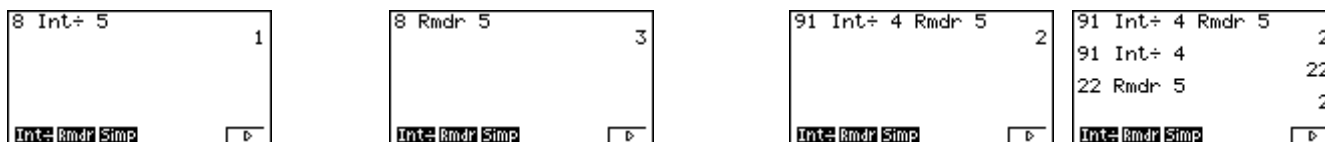
Solve and SolveN in RUN-MAT



The Solve feature [F1] utilises the Newton-Raphson method based on the initial x_0 , so depending on what is stored in the memory space X you will only get 1 real solution. The SolvN feature [F5] utilises an advanced Newton-Raphson method that will source all real solutions. So if there are multiple solutions you will be presented with a **WARNING** message.

Int÷, Rmdr in RUN-MAT Accessed via OPTN CALC [F6]

Int÷ [F1] gives the integer result for a division and **Rmdr** [F2] gives the remainder when you complete a division.



The integer value of $8 \div 5 = 1$ The remainder of $8 \div 5 = 3$

Combining these two operations

The formula $e^{\pi i} + 1 = 0$

Consider the series expansions for e^x , $\cos x$ and $\sin x$ which can be found using Taylor's expansion.

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

Now consider

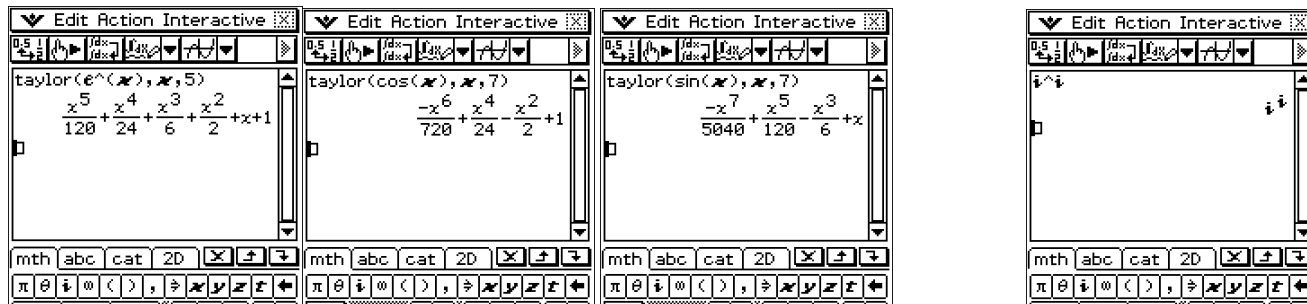
$$\begin{aligned} e^i &= 1 + i + \frac{i^2}{2!} + \frac{i^3}{3!} + \frac{i^4}{4!} + \frac{i^5}{5!} + \dots \\ &= 1 + i - \frac{1}{2!} - \frac{i}{3!} + \frac{1}{4!} + \frac{i}{5!} - \frac{1}{6!} - \frac{i}{7!} + \dots \\ &= (1 - \frac{1}{2!} + \frac{1}{4!} - \frac{1}{6!} + \dots) + i(1 - \frac{1}{3!} + \frac{1}{5!} - \frac{1}{7!} + \dots) \\ &= \cos 1 + i \sin 1 \end{aligned}$$

It follows that $e^{i\theta} = \cos \theta + i \sin \theta$

Setting $\theta = \pi$ we obtain $e^{i\pi} = \cos \pi + i \sin \pi = -1$

This last result, $e^{i\pi} = -1$ gives a clear link between $e = 2.71828\dots$, $\pi = 3.14159\dots$ and i .

Question: Is i^i a real number?



A last word!

Well again, that's all I can fit onto the 4 pages! Enjoy the term! Hope to see you at some workshops or hear from you via this newsletter or otherwise! 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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