Graphical Times.
Volume 7, Issue 25, 2008.

Welcome back to term 1!
Well the summer has brought us a mixed bag of weather across the country so far but hoping that you have had a good book to read during the time that you have taken out from preparing for 2008.
The new curriculum can be ordered from: orders@learningmedia.co.nz or by calling 0800 800 565
and/or visiting http://nzcurriculum.tki.org.nz/ for the electronic version and background.
NCEA saw record number of papers sat externally (1.9 million NCEA examination papers), a few flaws in the paper checks as illustrated in the level 2 Trigonometric paper:
Extracted from: http://www.nzqa.govt.nz/nqfdocs/ncea-resource/exams/2007/90292-exm-07.pdf

Question Five Tara has a glass house that is not heated. She knows that, on the 1st November, the minimum temperature of 11 °C was recorded at 7 am and the maximum temperature of 27 °C was recorded at 1 pm.
Tara is trying to find the length of time, on 1st November, when the temperature inside the glasshouse was above 23 °C.
She chooses to model the temperature T °C inside the glass house by a function of the form where t is the number of hours since 7 am. $T = A\sin(^{\pi t}/_{12}) + B$
Between what times, **and** for how long, would she predict the temperature to have been above 23 °C?

OPPS!
BUT GREAT to see in the CAS algebra standard!
Extracted from: http://www.nzqa.govt.nz/nqfdocs/ncea-resource/exams/2007/90799-exm-07.pdf

QUESTION ONE
Write two algebraic terms that, when multiplied together, have an answer of $24x^6$.
QUESTION FOUR
Is $(x + 8)^2 - 4$ equivalent to $(x + 7)(x + 9) - 3$ for all values of x?

Hope that you find aspects of this newsletter and associated worksheets helpful and look forward in providing services to assist the teaching and learning of mathematics and statistics. All the best and we look forward to working with you again in 2008.

Included in this terms newsletter are:
Graphic calculator activities –

- **Worksheets for: Graphic calculator: Estimating pi**
  ClassPad 300: Summing to infinity and beyond

Term 1 pricing list – included in this mailout along with 'Back to School' specials available during February 2008 or while stocks last.

CAS standards:
Level 1:
Demonstrate an understanding of straightforward algebraic methods 90799
Demonstrate an understanding of the features of graphs 90800
These can be viewed in more detail at:
http://www.nzqa.govt.nz/ncea/assessment/search.do?query=mathe&view=achievements&level=01
Level 2:
Demonstrate an understanding of mathematical relationships 90806
Demonstrate an understanding of calculus methods 90807
Demonstrate an understanding of processes involving trigonometry and coordinates 90808
Demonstrate understanding of straightforward mathematical processes 90809
These can be viewed in more detail at:
http://www.nzqa.govt.nz/ncea/assessment/search.do?query=mathe&view=achievements&level=02
Level 3 and Scholarship:
Pending release later in 2008

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

	→		→		→		→		→	
	→		→		→		→		→	

New Numeracy Standards:
Use numeracy strategies to solve problems involving whole numbers 23738
Use numeracy strategies to solve number problems involving decimals, percentages and fractions 23739
These can be viewed in more detail at:
http://www.nzqa.govt.nz/ncea/assessment/search.do?query=Number&view=units&level=01

Workshop opportunities.

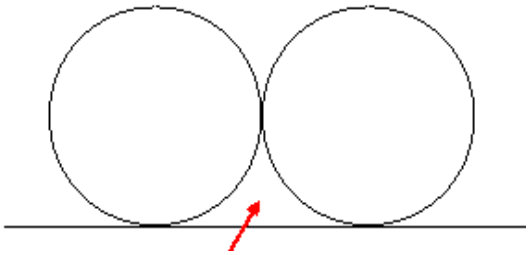
Workshop opportunities, if you would like to have a workshop for teachers and or students then please make contact with ***Graphic Technologies***. A large number of schools are taking up this opportunity either singularly or as a cluster of schools with both the graphic calculator or with the ClassPad300+, to look at how the graphic calculator and CAS could impact on and be integrated into your classroom practice.

Some basic functions on the ClassPad300.

Version 3 is just been released and with each ClassPad300+ ordered you will free ClassPad manager software OS Version 3 for you to install onto your PC and transfer this OS onto your hand-held ClassPad 300.
Some aspects regarding Version 3.0 Operating System 3.0 is equipped with the Statistics and TVM (Time, Value and Money) functionality of the FX9750G+, CFX9850GB+ and CFX9850GC+, but greatly enhanced.

Replacement parts:
Stylus: Part No: 1010 4597 - $4.00 + GST
Protective Sheet: Part No: 1011 7012 - $4.00 + GST
Hard Cover: Part No: 1011 4575 - $4.00 + GST

A Problem:
Imagine two exactly equal circles, just touching each other at a point, and sitting on a straight line, just touching that line. In the area enclosed by the circles and the line, you can draw various straight-edged triangles (Not concerned with any shapes that have curved edges). Want to draw a straight-edged triangle inside that enclosed area (arrowed)



Can you solve this problem using the ClassPad300+? (Hint: A right-angled isosceles triangle will have a greater area than any other straight-lined triangle you can draw in that space?
Looking forward to receiving some solutions sent in.

Worksheets downloaded off the web.

Monaco Corporation's website has been upgraded and it is easier to view and download the worksheets. There are links to other informative mathematics education websites too. For teachers we currently offer a large number of 'classroom ready' resources available are designed primarily for the CASIO® FX9750G, FX9750G Plus, CFX9850GB, CFX9850GB Plus models of graphical calculators and the ALGEBRA 2.0. There is also a variety of activity sheets designed for the ClassPad 300 models. All of the activities and worksheets are designed for beginners to advanced users of the G.C. and C.A.S. all useful for all secondary year levels. More have been added to the website since the last newsletter. Bookmark: www.monacocorp.co.nz/casio

Websites of mathematical interest.

http://www.vcnet.com/~simonp/mathcounts/workout6.pdf Some problems with solutions.

http://www.worldofnumbers.com/ninedig1.htm What can you do with 123456789!

http://matcmadison.edu/is/as/math/mathclub/ProblemSets/V01/default.htm Problem in sets of 3 with solutions provided.

http://mathforum.org/library/drmath/sets/high_puzzles.html?s_keyid=23527192&f_keyid=23527196&start_at=321&num_to_see=40 A home page giving you access to lots of mathematical problems.

http://www.archimedes-lab.org/numbers/Num1_69.html Fascinated with numbers? "What's Special About This Number" Facts are provided illustrating the history, misconceptions, errors made and so on.

http://www.emaths.co.uk/powerpoint.htm Using powerpoint to teach...Lots of PPT files available for you to use.

http://jc-schools.net/ce/ppt6-12math.htm More of PPT files for you to use.

http://www.shsu.edu/~txcae/lessons.html A collecting of pre-tests, lessons and post-tests covering most strands at the junior class level.

http://lessonplancentral.com/lessons/Powerpoint_Presentations/Mathematics/index.htm More PPT files for you to use.

http://www.highland.madison.k12.il.us/jbasden/pods/99_00_pods.html Problems of the day.

http://www.centenary.edu/math/problem A Problem of the Week contest!

http://mathforum.org/library/topics/graphing_equations/ A library of websites with interactive java.

http://www.themathpage.com/alg/algebra.htm Examples and notes on skills required in algebra, covering Y9 – Y13 ideas and concepts.

http://coe.jmu.edu/mathvids2/ An interactive website for teaching mathematics to learners having difficulty in learning mathematics.

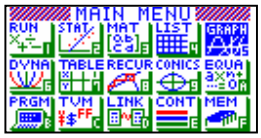
http://www.mathematics-au.com/mathematics.com.au/guest.html 32 free lessons (NZ Y8-Y12) and if you are interested you can subscribe to this Australian website and its products.

CAST.

An update had been released in this software from Massey University, CAST 3.3 Visit: http://cast.massey.ac.nz to register (if you have not yet) and download via the New User link on this webpage and run from your computer or server. If you experience any problems with the download or the running of CAST, please email d.stirling@massey.ac.nz for assistance.

Classroom Activities.

A. The Duel Screen:Graph
In the Graph icon,
from the **MAIN MEN**



Enter into **SET UP**
[SHIFT] [MENU] and arrow
down to **Dual Screen,** then **[F1]**.

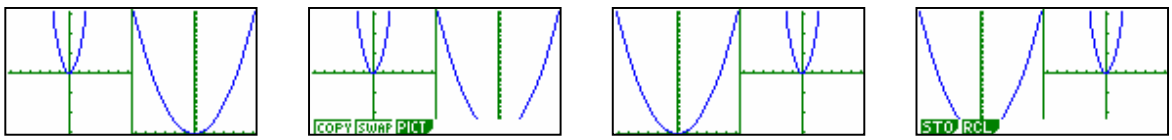
You can alter the V-Window
on both screens. **[SHIFT] [F3]**

Left:
Alter as per usual.

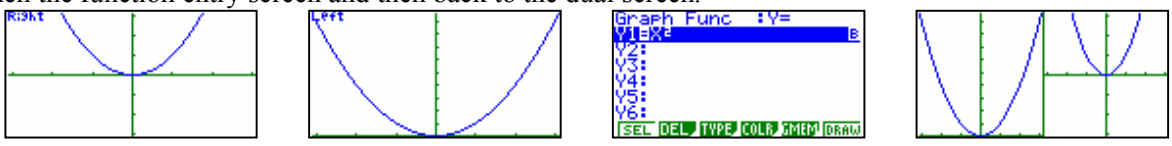
Right: [F6]
Alter as per usual.

Enter the functions that you wish to draw as per usual.
When you draw them and copy to the Right sided Dual Screen, they become the '**BASE**' function. See the 'B' on the graph function display. [N.B. The left graph is ALWAYS the interactive one!]

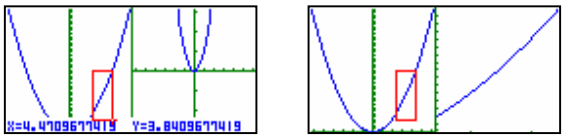
You can **COPY**, **SWAP**, **STORE** and **RECALL** the functions via **[OPTN]**, **[F1]**, **[F2]** or **[F3]**.



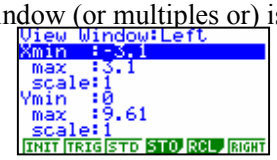
[SHIFT] [F6], G↔T, will see the graphing window change to full screen to display firstly the Left screen and then the right, then the function entry screen and then back to the dual screen.



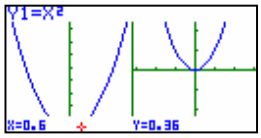
You can 'BOX' a part of the graph to analyse further in the active window and the right window will display the region selected.



For 'tracing' the function, **[SHIFT] [F1]**
The best V-Window (or multiples or) is:



This is due to the vertical splitting of the screen. Making each set of axes 63 pixels wide.



B. Solve **(a)** $x = e^x$, **(b)** $x^2 = e^x$, **(c)** $x^3 = e^x$,
(d) $x^4 = e^x$, **(e)** $x^{20} = e^x$, **(f)** $x^n = e^x$

What do you notice? How could you find **ALL** solutions in the **EQUA** icon?

C. A 3×3 magic square. Let the common sum be 'L'.

a	b	c
d	e	f
g	h	i

Equations that can be formed are: $a + b + c = L$ $d + e + f = L$ $g + h + i = L$ $a + d + g = L$
$b + e + h = L$ $c + f + i = L$ $a + e + i = L$ $c + e + g = L$

BUT we only need $c + e + g = L$, $a + e + i = L$ and $d + e + f = L$.
Adding them all together gives: $c + e + g + a + e + i + d + e + f = 3L$
Rearranging gives: $(a + d + g) + 3e + (c + i + f) = 3L$
$L + 3e + L = 3L$
$3e = L$ Thus, if you know 3 numbers in the magic square it can be completed!

Try this one! (Cut out the squares, mix and put back together) **Make your own up!**

2a + 6b	4a + b	6a + 2b			
8a - b	4a + 3b	7b			
2a + 4b	4a + 5b	6a			

Help desk.

Question: Would you please send me the instructions how to change my decimal solution to solving a linear equation on the GC to a fraction. The question in particular was (2x-4)/5 = 3x+1
Response: In solver the calculator is using Newton-Raphson method (N-R) to solve and hence you will not get a fraction equivalent. Solving these under the GRAPH icon will also yield a decimal answer , N-R again! Entering them in Sim Eq, you will get the fraction answer: 2x - 5y = 4 and 3x – y = -1
Question: We were trying to solve sinx=-1 using graphic calculator
Angle in degree, v-window was set in degrees. Using graph menu. Enter y1= sinx. Y2= -1. Graph , G-solve, isct, Calculator says not found!
Response: On V-window
Xmin:-360 Max:360 Scale 1 Ymin:-1 Max:1 Scale:1
It is important that the screen displays the domain to seek solutions. The calculator uses the Newton-Raphson method to solve and can only solve when the x-values are in the V-window.

A last word!

Well again, that's all I can fit onto the 4 pages! Have a great term 1! Hope to see you at some workshops or next term 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 either by snail - mail, email, telephone, text or fax.

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