

# Graphical Times.

## Volume 10, Issue 39, 2011.



Welcome back to the start of term3! We hope you have had a restful break and rearing to go in this 11 week pre-World Cup term! We hope you enjoy this newsletter. Hope that the attendees of the NZAMT 12 conference enjoyed the 4 days of southern hospitality. 2013 sees Wellington host NZAMT13 as the journey continues... *“Absolutely and positively maths and stats.”*

### What's in here!

Included in this terms newsletter are:

Calculator activities for the Classpad 330+ and Casio graphic calculator

- **Worksheet for the Classpad 330 +:**  
Why is the area 18?
- **Worksheets for the FX9750GII and similar models:**  
Arithmetic Sequences and Simultaneous Equations.

Term 3, 2011 pricing list.

N.B. The 2011 Graphic Technologies Catalogue is available on request.

Please email us: [graph.tech@xtra.co.nz](mailto:graph.tech@xtra.co.nz), to receive your free copy.



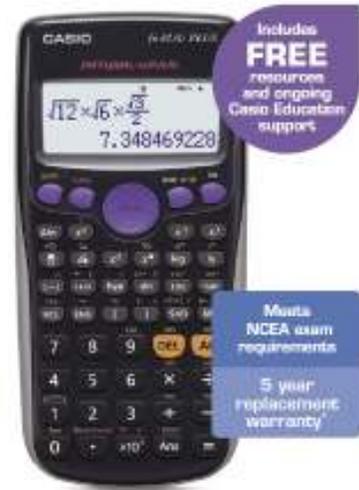
### Workshop opportunities.

**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.

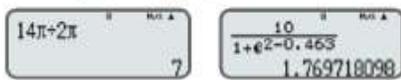
### New product - Introducing the FX82AU

By now you would have received an introduction pack from Monaco introducing this model into New Zealand. Its introduction will be supported by resources (existing and new each term) to assist with its use in the NZ classroom based on NZC (2007).

The FX82AU was launched in New Zealand at the NZAMT12 conference in Dunedin.



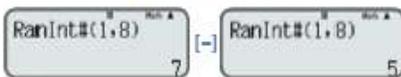
**Natural input and Intelligent use of Screen**  
No more, 'technology-required' brackets.



**PC Emulator Software**  
This comprehensive calculator emulator is the perfect teaching companion. It is used for interactive whiteboards and computers.



**Random Integer Functions**



**'How Do I...On a Casio fx-82AU PLU!'**  
Written specially to support New Zealand maths teachers in assisting students to learn all the capabilities of the fx-82AU PLU!, the online learning manual has simple mathematical tasks with concise how-to sequences, images and screenshots.

### 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® FX9750Gii, FX9750G, FX9750G+, CFX9850GB, CFX9850GB+, CFX9850GC+, FX9750GA+ and FX9750Gii models of graphical calculators and the ALGEBRA 2.0.

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

	→		→		→		→		→	
	→		→		→		→		→	

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

## Update information

CASIO has announced the release of:

- ClassPad 300/330 series OS Update for Ver 3.06
- ClassPad Manager series OS Update for Ver 3.06
- Screen Capture Version 1.02 for ClassPad 300/330 series.

Visit the following sites to get the latest information

- CASIO Educational website: <http://edu.casio.com/>
- Product page for ClassPad 330  
[http://edu.casio.com/products/classpad/cp\\_v302/](http://edu.casio.com/products/classpad/cp_v302/)

### 1. ClassPad 300/330 series OS Update for Ver 3.06

This software can be downloaded by going through the following CASIO Educational website pages.

Go to:

[http://edu.casio.com/products/cp\\_soft/cp\\_agreement.html](http://edu.casio.com/products/cp_soft/cp_agreement.html)

- Click [Accept]
- Select "OS Update for Ver.3.06" at "ClassPad 300/330 series"
- Click [NEXT]
- Click "\*Version 3.06" to download the file.

### 2. ClassPad Manager series OS Update for Ver 3.06

This software can be downloaded by going through the following CASIO Educational website pages.

Go to:

[http://edu.casio.com/products/cp\\_soft/cp\\_agreement.html](http://edu.casio.com/products/cp_soft/cp_agreement.html)

- Click [Accept]
- Select "OS Update for Ver.3.06" at "ClassPad Manager series"
- Click [NEXT]
- Click "\*Version 3.06" to download the file.

### 3. Screen Capture Version 1.02 for ClassPad 300/330 series

This software can be downloaded by going through the following CASIO Educational website pages.

Go to:

[http://edu.casio.com/products/cp\\_soft/cp\\_agreement.html](http://edu.casio.com/products/cp_soft/cp_agreement.html)

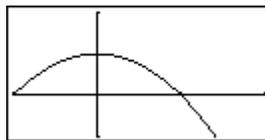
- Click [Accept]
- Select "Support Software" at "ClassPad 300/330 series"
- Click [NEXT]
- Click "\*Version 1.02" to download the file.

## A problem!

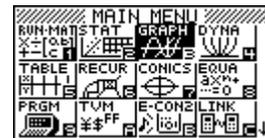
In the **GRAPH** icon.

Consider the function  $y = 1 - x^2$  between  $0 \leq x \leq 1$ .

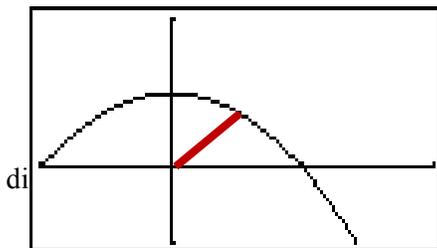
Enter the function:



Resize the View-window:



What is the shortest length of a chord from  $(0, 0)$  to a point on  $y = 1 - x^2$  between  $0 \leq x \leq 1$ .



Let the length be  $l = \sqrt{x^2 + (1 - x^2)^2}$

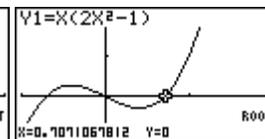
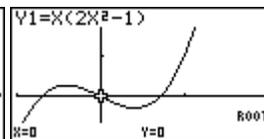
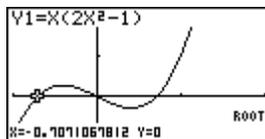
Maximum/minimum is found when  $dl/dx = 0$ .

BUT ... consider  $l^2 = x^2 + (1 - x^2)^2$ .

This gives  $2l \times dl/dx = 2x + 2(1 - x^2) \times -2x = 2x - 4x(1 - x^2)$  by implicit

Equating the numerator and solving gives:  $0 = x - 2x(1 - x^2) = 2x^2 - x = x(2x^2 - 1)$ .

Solutions  $x = 0$  or  $x = 1/\sqrt{2}$ , use the G-Solve feature in the **GRAPH** icon to illustrate these two solutions and determine which is the maximum and which is the minimum.



Now, consider the function  $y = 2 - x^2$  between  $0 \leq x \leq \sqrt{2}$ .

Then consider the function  $y = 3 - x^2$  between  $0 \leq x \leq \sqrt{3}$ , then consider the function  $y = 4 - x^2$  between  $0 \leq x \leq 2$ , ...

Now generalize...  $y = n - x^2$  between  $0 \leq x \leq \sqrt{n}$ .

What do you notice?

Can the values that minimize the length of a chord from  $(0, 0)$  to a point on  $y = n - x^2$  between  $0 \leq x \leq \sqrt{n}$  be generalized too?

What is the equation that links these values of  $x$  that minimize the chord from  $(0, 0)$  to a point on  $y = n - x^2$ .

Investigate!

## Websites of interest...

Crazy paper folding: <http://www.stumbleupon.com/su/2HMIml/www.youtube.com/watch%253Fv%253Dfc1X8VJBfDA>

A short TED video: [http://www.ted.com/talks/arthur\\_benjamin\\_s\\_formula\\_for\\_changing\\_math\\_education.html](http://www.ted.com/talks/arthur_benjamin_s_formula_for_changing_math_education.html)

Could be great to use in the lead up to the Rugby World Cup. Check out: <http://www.ruggerland.co.nz/>

Microsoft maths 4: <http://www.edgalaxy.com/journal/2011/2/8/microsoft-maths-40-now-totally-free-for-teachers-and-student.html>

## NEW RESOURCES FOR TEACHING STATISTICS: FREE SOFTWARE AND CASE STUDY VIDEOS

You can access GenStat and get the GTL software license and installation procedure at the VSN website:

[www.vsn.co.uk/software/genstat-teaching/](http://www.vsn.co.uk/software/genstat-teaching/)

A set of case study videos and introductory lessons using GTL at the University of Otago Dept of Mathematics and Statistics website: [www.maths.otago.ac.nz/videos/statistics](http://www.maths.otago.ac.nz/videos/statistics)

## Some new features of the FX9750Gii explored.

The differentiation algorithm has been enhanced in the FX9750Gii model and if you are using the Newton-Raphson method in the **RUN** icon you may have experienced a 'Time out' message. You will notice that when checking the value of  $x$  when the 'Time out' message has been cleared is correct to 5 or 6 decimal places. There are two ways to get around this so that you and your students calculators are not timed out.

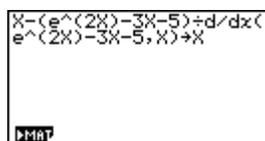
What does this mean and how can you get rid of it!

Consider solving  $e^{2x} - 3x - 5 = 0$  with a starting value  $x_0 = 0$ .

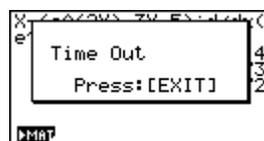
?  $\rightarrow x: x - (e^{2x} - 3x - 5) \div (d/dx(e^{2x} - 3x - 5, x))$  with an initial value of  $x = 0$ .



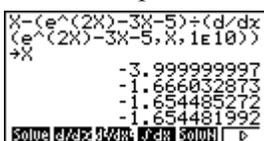
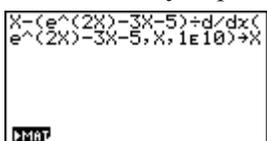
$\rightarrow$



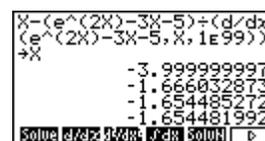
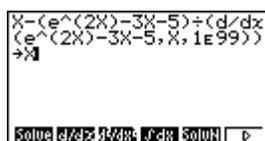
$\rightarrow$



An extra step is required in the editing stage – by placing in a large number which gives 'bounds to the recursive  $x$  calculations as you perform Newton-Raphson method.



OR



10 000 000 000

producing

$1 \times 10^{99}$

producing

This extra step is placing a tolerance level for  $x$ .

## OR

Do not use 'd/dx(', instead use the given derivative function, in the editing aspect of the Newton-Raphson method in the calculator.

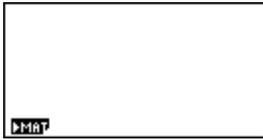
```

X-(e^(2X)-3X-5)+(2e^(
2X)-3)+X
-4
-1.666032873
-1.654485272
-1.654481992
-1.654481992
MAT

```

This extra step of placing in a tolerance is now **not** required.

**Note 1:** The symbols ‘?’ and ‘:’ can be found in the **PRGM** menu via **[SHIFT] [VARS]**.



**[SHIFT] [VARS]**



**[F4]** for ?



**[F6]** then **[F4]** for :

**Note 1:** d/dx( be found in **[OPTN]** via **[CALC]** then **[F2]**.



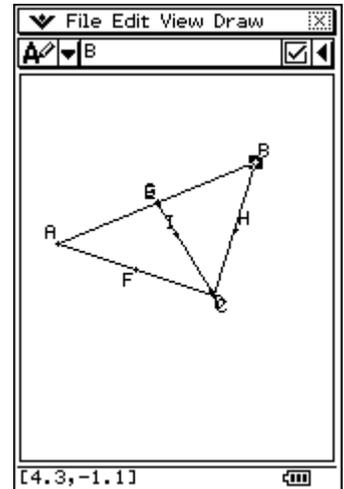
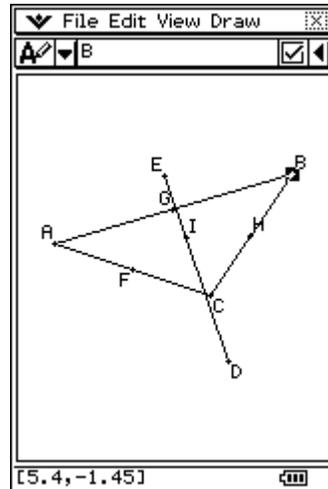
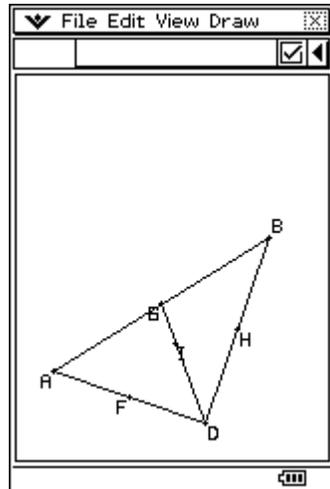
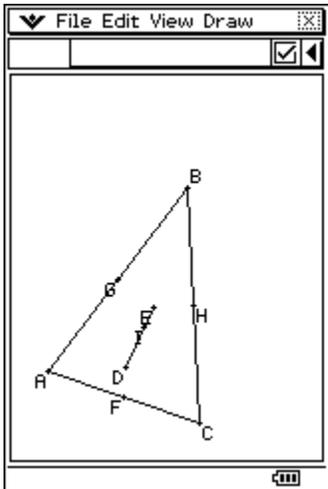
**[OPTN] [CALC]**



then **[F2]** for d/dx(

## A geometrical problem to finish on!

Below are some screen shots of different triangles,  $\triangle ABC$  with midpoints to the triangle sides are G, H and F with the three points E, D and I being the incentre, circumcentre and centroid. E, D and I are joined by a line segment.



What type of triangle has the line segment E, D and I as its altitude?

What conditions are necessary for only the point E to lie outside of the triangle?

What conditions are necessary for only the point D to lie outside of the triangle?

Can the point I ever lie outside the triangle?

What type of triangle have the three points E, D and I coinciding?

## 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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