

# Graphical Times.

## Volume 13, Issue 53, 2015.



Welcome back to term 1, 2015! Hope that you had an enjoyable summer break and rearing to go for the academic year. Please find this term 1's newsletter and activities informative and the pricing giving you and your students significant savings from the RRP. 'Back to school' prices are valid until 28<sup>th</sup> February 2015. Important dates for the 2015 calander to note, is the NZAMT Conference being held in Auckland, 7<sup>th</sup>-10<sup>th</sup> July 2015 at AUT.

### 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: [Solving linear equalities and inequalities](#)**
- **Worksheet for the FX9750GII and similar models: [Using basic programming for illustrating formula substitution](#)**
- **Worksheet for the FX82AU+II and similar models: [The use of Pol\( and Rec\(](#)**
- **'Back to School' pricing valid until 28<sup>th</sup> February 2015**
- **Term 1 pricing valid until 20<sup>th</sup> April 2015**

### 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 having acknowledged that year 12 & 13 students without the use of a graphical calculator being disadvantaged, a large number of schools are taking up the opportunity to up skill teachers and students in using these mathematics/statistics technologies.



### Program to support the use of the FX82AU+II and FX9750GII.

Casio Education NZ launched the 'Top Schools Program' is to support schools using the FX82AUplus II scientific and FX9750GII graphic calculators. The goal of 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 will be offered in conjunction with Graphic Technologies supporting this initiative.

**Details of the program can be uploaded from:** [www.casio.edu.monacocorp.co.nz](http://www.casio.edu.monacocorp.co.nz)

**Please make sure that your schools stationery lists are updated for 2015.**



### Classpad update.

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 and these can also 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 your ClassPad II. eActivities, files and programmes can also be transferred from calculator to calculator using the SB-62 cabling. Visit: <http://www.classpad.com.au/index.html>



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

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## Graphic Technologies Specials for 'Back to School', 2015.

Product	Price per unit (excl GST)
<a href="#">FX9750GII</a> graphic calculator (monochrome) RRP \$132.95	\$77.00
<a href="#">FX82AU</a> plus II scientific calculator RRP \$33.95	\$17.00
<a href="#">FX-CG20</a> GRAPHIC CALCULATOR New model	\$200.00
<a href="#">FX991ES</a> plus scientific calculator	\$60.00
AAA Batteries Card of 4 (Minimum 12 cards (48) an order)	\$4.50
AA Batteries Card of 4 (Minimum 12 cards (48) an order)	\$4.50

**Note:** Back to School promotions end 28<sup>th</sup> February, 2015.

## Graphic Technologies term 1 pricing from 1<sup>st</sup> March, 2015

Product	Price per unit (excl GST)
<a href="#">FX9750GII</a> graphic calculator (monochrome) RRP \$132.95	\$82.00
<a href="#">FX82AU</a> plus II scientific calculator RRP \$33.95	\$23.00
<a href="#">FX-CG20</a> GRAPHIC CALCULATOR New model	\$210.00
<a href="#">FX991ES</a> plus scientific calculator	\$65.00
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

**Note:** term 1 pricing is valid from 1<sup>st</sup> March until 20<sup>th</sup> April, 2015.

## Websites of interest.

<http://mathforum.org/yeargames/> Use the digits in the year 2015 and the operations '+', '-', '×', '÷', '^' (raised to a power), '√' (square root), and '!' (factorial), along with grouping symbols [ with ] or ( with ) etc., to write expressions for the counting numbers 1 through 100. For example  $2^{0 \times 1 \times 5} = 1$ ,  $2 + 0 \times 1 \times 5 = 2$ ,  $2 + 0 + 1^5 = 3$ ,  $2^{\sqrt{0-1+5}} = 4$ , ...

## ClassPad update.

[http://www.casio.edu.shriro.com.au/cr\\_classpad\\_corner.php](http://www.casio.edu.shriro.com.au/cr_classpad_corner.php)

## Worksheets downloaded off the web.

Visit Monaco Corporation and Graphic Technologies websites 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, FX82AU+ii, FX9750Gii, FX9750G, FX9750G+, CFX9850GB, CFX9850GB+, CFX9850GC+, FX9750GA, FX9750GA+ and FX9750Gii and the ClassPad300, 300+, 330A and 330A+ series. More have been added to the website since the last newsletter.

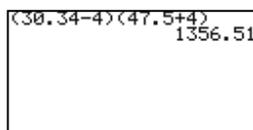
**Please visit:** [www.casio.edu.monacocorp.co.nz](http://www.casio.edu.monacocorp.co.nz) and <http://graphic-technologies.co.nz>

## Algebraic substitution

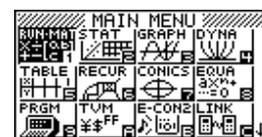
Select **RUN-MAT** mode from the main menu by using the arrow keys to highlight the **RUN-MAT** icon then press **EXE** or pressing the **[1]** key.

**Example:** Calculate  $V = (A - 4)(B + 4)$  where  $A = 30.34$  and  $B = 47.5$

**Answer:** Enter the calculation by replacing each letter in the formula with its corresponding number. Then press the **EXE** key for the answer.



(30.34-4)(47.5+4)  
1356.51



When you have a number of algebraic substitutions to do then it would be easier to use the memory aspect of the calculator keys. There are 28 different storage places i.e A ~ Z, θ and Γ. You can 'assign' a value to the letters you want

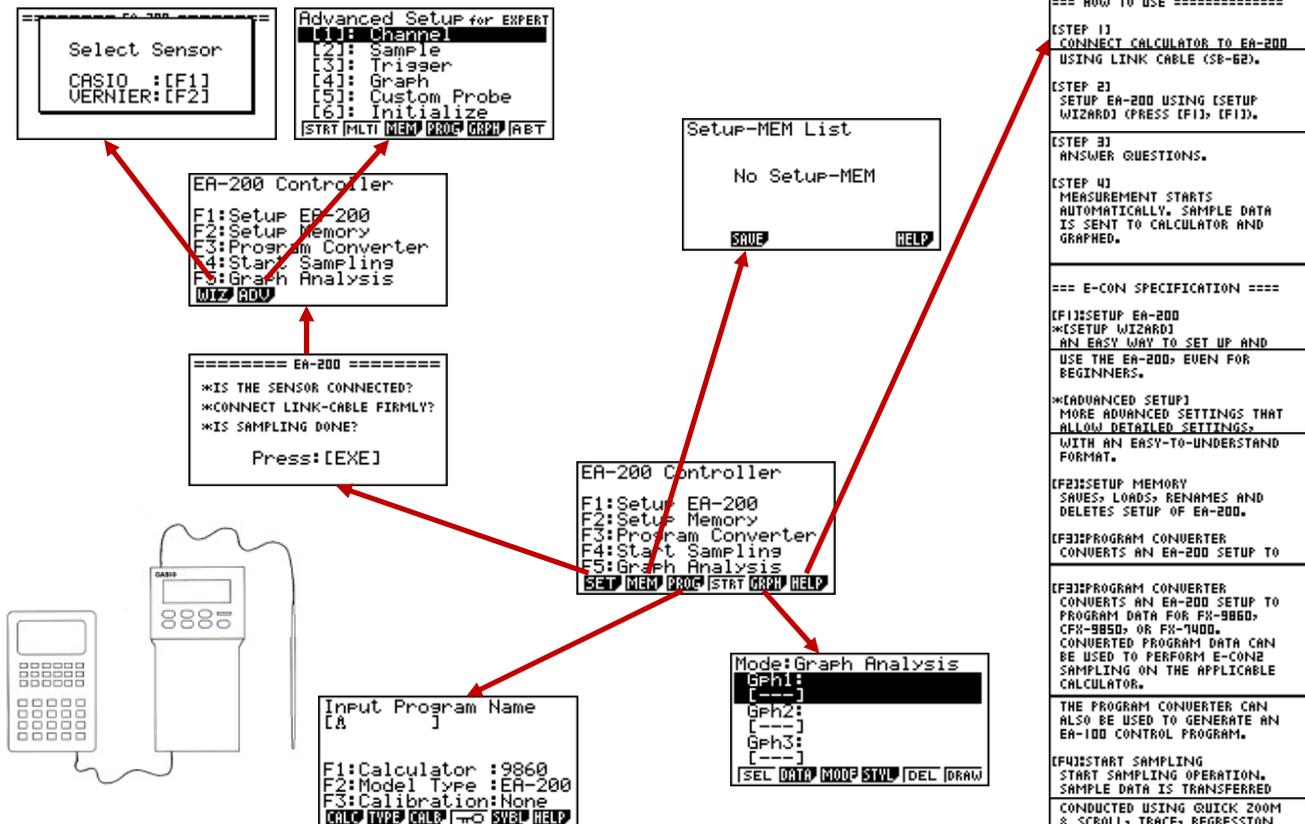
to use, then enter the algebraic expression into the calculator. See the worksheet 'Using basic programming for illustrating formula substitution'.

**Example:** Calculate  $V = (A - 4)(B + 4)$  where  $A = 30.34$  and  $B = 47.5$   
Using the arrow [→] this 'assigns' a number to a letter. Press **EXE** for the calculator to store the value in the memory.

30.34→A	
47.5→B	30.34
(A-4)(B+4)	47.5
	1356.51

## E-CON2

Collecting and analysing data collected from probes attached to the EA-200 data logger attached to a FX9750Gii (master) and 6 (maximum) other FX9750Gii calculators.  
How it works!



The Datalogger User Manual can be downloaded from:

[http://www.casio.edu.shriro.com.au/products/ea200Datalogger/pdf/e\\_con2\\_manual.pdf](http://www.casio.edu.shriro.com.au/products/ea200Datalogger/pdf/e_con2_manual.pdf)

Covering:

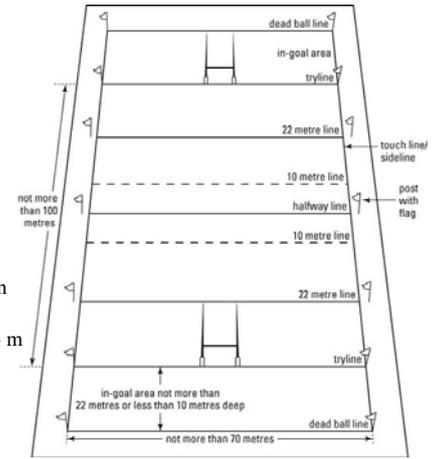
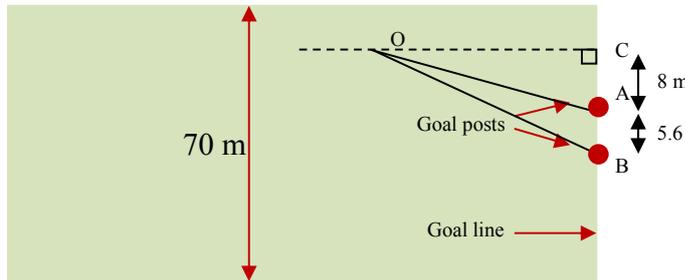
- E-con2 Overview
- Using the Setup Wizard
- Using Advanced Setup
- Using a Custom Probe
- Using the MULTIMETER Mode
- Using Setup Memory
- Using Program Converter
- Starting a Sampling Operation
- Using Sample Data Memory
- Using the Graph Analysis Tools to Graph Data
- Graph Analysis Tool Graph Screen Operations



## A Rugby - Trigonometric problem!

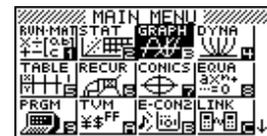
The goal posts, a minimum of 3.4 metres high, placed 5.6 metres apart and connected by a horizontal bar 3 metres above the ground. When a try is scored a conversion attempt is taken from a position perpendicular to where the try was scored.

**Question:** Where is the best position to place the ball for the conversion kick to maximise the chances of converting the try? That is, to give plenty of room for error in the kick. They need to maximise the angle between the two vertical posts?  
**Example:** Suppose a try is scored 8 metres from the left post (See diagram, not to scale.), where should the kicker place the ball to maximise the angle AOB?



Angle AOB = Angle BOC – Angle AOC =  $\tan^{-1}(13.6/OC) - \tan^{-1}(8/OC)$   
 Let  $OC = x$  and Angle AOB =  $y$ , giving the equation  $y = \tan^{-1}(13.6/x) - \tan^{-1}(8/x)$

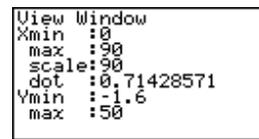
Enter the **GRAPH** icon and in **Y1** space enter the equation:  $\tan^{-1}(13.6/x) - \tan^{-1}(8/x)$ .



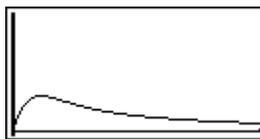
Press **EXE** to store.

Set up the angle to be degrees [**SHIFT**] [**MENU**] and scroll down to 'Angle' and press [**F1**] to be in degrees (°), and then [**EXIT**].

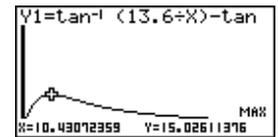
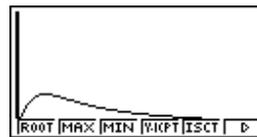
Set the V-window [**SHIFT**] [**F3**] to TRIG [**F2**], then change the Xmin, Xmax and Ymax to the values, as shown below, then [**EXIT**].



Draw the graph 'Y1' by pressing [**F6**] or **EXE**.



Now use **G-Solve** [**SHIFT**] [**F5**], to find the maximum value, [**SHIFT**] [**F3**], for the angle and where to place the ball for the kick.



To the nearest 10<sup>th</sup> of a metre, the kicker places the ball 10.4 metres from the Goal line and the maximum angle is 15° (to the nearest degree).

**Investigation:** Is there a pattern to where the ball is to be placed if the try is scored from the midpoint of the goal posts working outwards to the sideline?

## 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 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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