Graphical Times.
Volume 14, Issue 55, 2015.

Welcome back to term 3, 2015! Hope that you had an enjoyable
July break! Please find this term 3's newsletter and activities informative and term 3 pricing giving you and your
students significant savings on the RRP. Lots of resources should be populating the NZAMT website from the
NZAMT14 Conference held in Auckland over the break. Congratulations to the AMA conference organising
committee. 2017 will see the NZAMT15 conference in Christchurch.

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: Sequences and Series**
- **Worksheet for the FX9750GII and similar models: Restricted domains of graphs**
- **Worksheet for the FX82AU+II and similar models: How many triangles are there?**
- **Term 3 pricing is valid until 11th October, 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 practices. With NZQA having acknowledged that years
11, 12 & 13 students without the use of a graphical calculator are
being disadvantaged. A large number of schools have taking up the
opportunity to up skill teachers and students in using these
mathematics/statistics handheld technologies.

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

Casio Education NZ launched the 'Top Schools Program' 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. **Please make sure that your schools stationery
lists are updated for 2016. Details of the program can be uploaded from:** www.casio.edu.monacocorp.co.nz

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 Term 3, 2015.

Pricing specials for batteries, valid until for term 3 only, ends 11th October, 2015.

Product	Price per unit (excl GST)
AAA Batteries Card of 4 (Minimum 12 cards (48) an order)	$4.00
AA Batteries Card of 4 (Minimum 12 cards (48) an order)	$4.00
Back up battery CR2032 [for graphic calculator]	$2.00

Terms 2 and 3, 2015 - Casio XJA242 Data Projector Promotion.

The winning school is: Papatoetoe High School. They will be receiving the schools prize for July, 2015, the term 2 random draw. Two to give away to schools who purchase products totalling $200 or more – one to give away each in terms 2 and 3, 2015.

Graphic Technologies are resellers of Casio projectors. If you are thinking of replacing your current data projectors or looking for additional units to meet your schools requirements then please consider any of the six units in our school range that suit your needs. Additional information on these data projectors is available on request or click on the URL link on the product in the pricing list.

Features include:

* ecologically sound and energy saving
* a mercury-free light source
* $2 \times$ optical zoom
* Lamp-free technology with up to 20,000 hours continuous performance
* WLAN capability
* USB 2.0 for FX9750Gii graphic calculator can be connected directly into the projector [XJA145]
* USB data files can be connected directly into the projector (USB data projectors only)
* is the size of a ream of A4 paper!

For term 3, 2015 we continue this promotion. For every order received during term 3, up to 26th September, 2015 will go into the draw for winning a XJA242, 2500 ansi lumen, wide screen data projector. One on offer each term
See http://www.casio-projectors.eu/euro/products/xja242/ for technical details and the Graphic Technologies pricing list of the six data projector models we are resellers for. See the term 3 pricing list for other products and specials.

Congratulations to **Alan Santos and his faculty at Papatoetoe High School** – the data projector is already on its way to you. Enjoy! Many thanks to all schools who purchased equipment during terms 2, the promotion continues into term 3 with the last Casio projector XJA242 up for grabs for schools purchasing products totalling $200 or more during term 3, 2015.

Websites of interest.

http://www.stats.govt.nz/ Statistics New Zealand home page
http://www.stats.govt.nz/statsmaps/home.aspx
http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/data-visualisations.aspx
http://www.stats.govt.nz/datavisualisation/commuterview/index.html
http://www.stats.govt.nz/tools_and_services/business-toolbox.aspx Business tools
http://www.stats.govt.nz/tools_and_services/schools_corner.aspx Schools corner
http://www.stats.govt.nz/browse_for_stats/education_and_training/secondary_education.aspx Reports and articles
http://www.stats.govt.nz/tools_and_services.aspx Tools and services
http://www.stats.govt.nz/tools_and_services/schools_corner/Activities/Interactive-Games.aspx Activities and interactive games for curriculum levels 1–6. These interactive games encourage students to have fun exploring the concepts of statistical methods.
http://www.stats.govt.nz/browse_for_stats/economic_indicators.aspx Economic indicators

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 and http://graphic-technologies.co.nz

Activity 1 – Graphing derivatives in GRAPH

Graphing derivatives: d/dx via the **GRAPH** icon.

Make sure that the derivative is 'turned on'.
SHIFT MENU for **SETUP** and scroll down to
Derivative and press **F1** to activate, then **EXIT**.
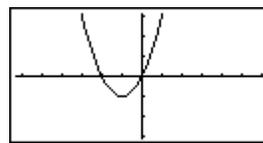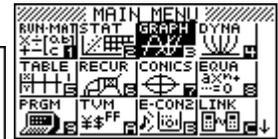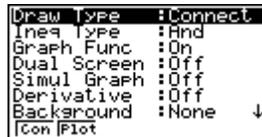
Enter the function

Set up the **V-Window**, **SHIFT F3**
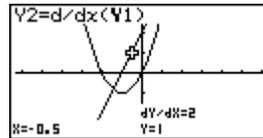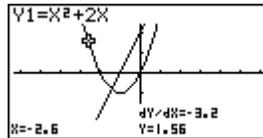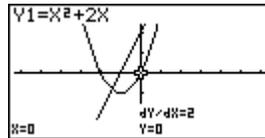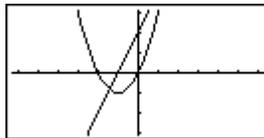(suitable for the function), then **EXIT**.

F6 or **EXE** to **Draw** checking
that the graph can be seen.
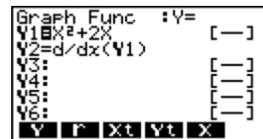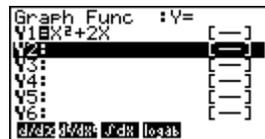
In the Y2 space, select **OPTN**

F2 for **CALC, F1** for **d/dx**.

F1 for **Y** and complete with '1' and ')'.
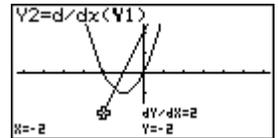
Draw the graphs and use '**Trace**' **SHIFT F1** to scroll over the graphs identifying coordinate points and the value of the derivative at these points. Use the left ◄ and right ► keys to trace over Y1 or Y2, and the up ▲ and down ▼ keys to jump to Y1 or Y2.
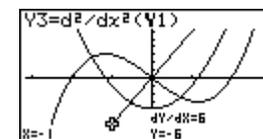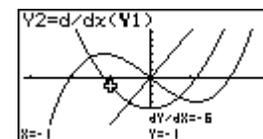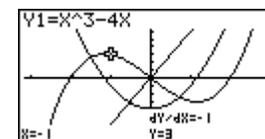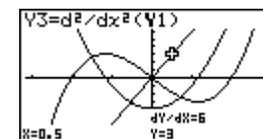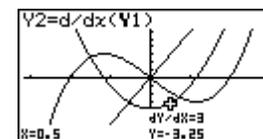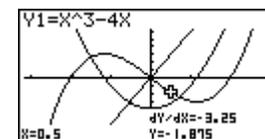
Graphing derivatives: d/dx **and** d^2/dx^2 via the **GRAPH** icon.
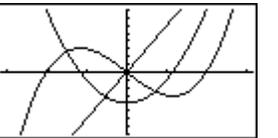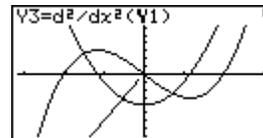
Enter the function, the
first and second derivatives.

Set up the **V-Window**, **SHIFT F3**
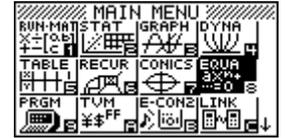(suitable for the function), then **EXIT**.

F6 or **EXE** to **Draw.**

Again, draw the graphs and use '**Trace**' **SHIFT F1** to scroll over the graphs identifying coordinate points and the value of the derivative at these points. Use the left ◄ and right ► keys to trace over Y1 or Y2, and the up ▲ and down ▼ keys to jump to Y1 or Y2.
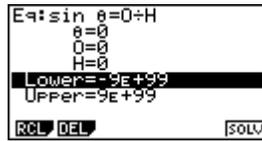
Activity 2 – Trigonometry in EQUA

Whether you use the mnemonic 'SOHCAHTOA' or triangles to illustrate the trigonometric relationships in the **EQUA**tion icon users can enter in the relationship and then substitute for the angle and one side (a short or hypotenuse side) to calculate the hypotenuse or the other short side length **OR** substitute two sides (both short or a short and hypotenuse side) to calculate the angle.

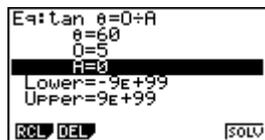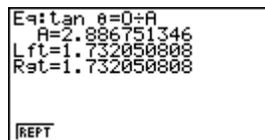| Equation Select Type F1:Simultaneous F2:Polynomial F3:Solver **SIML POLY SOLV**	Eq: **RCL DEL** [SOLV]	Eq:sin θ=O÷H θ=0 O=0 H=0 **Lower=-9ᴇ+99** Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:cos θ=A÷H θ=0 A=0 H=0 **Lower=-9ᴇ+99** Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:tan θ=O÷A θ=0 O=0 A=0 **Lower=-9ᴇ+99** Upper=9ᴇ+99 **RCL DEL** [SOLV]
F3 for **SOLV**er.	**DEL**ete or clear any equations.	Enter the required trigonometric relationship (set all variables to zero). Using Θ, A, O and H via the **ALPHA** key and = via **SHIFT** [**.**].		
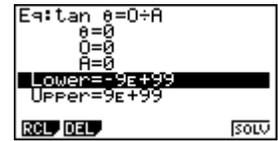
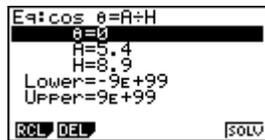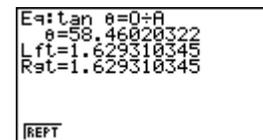Make sure that you are in the appropriate angle measure – either degrees or radians.
SHIFT MENU for **SETUP** and scroll down to **Angle**, and change to either Deg [**F1**] or Rad [**F2**] and then **EXIT**.
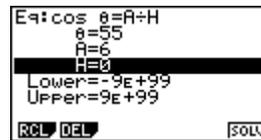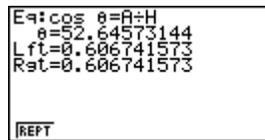
Frac Result :d/c
Func Type :Y=
Angle :Deg
Complex Mode:Real
Display :Norm1

[Deg] [Rad] [Gra]

Eq:tan θ=O÷A θ=60 O=5 **A=0** Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:tan θ=O÷A A=2.886751346 Lft=1.732050808 Rgt=1.732050808 [REPT]		Eq:tan θ=O÷A **θ=0** O=56.7 A=34.8 Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:tan θ=O÷A θ=58.46020322 Lft=1.629310345 Rgt=1.629310345 [REPT]

Solve tan(60º) = 5/A. Move the cursor to 'sit' over the target variable, A, and solve [**F6**].

Solve tan(Θº) = 56.7/34.8. Move the cursor to 'sit' over the target variable, Θ, and solve [**F6**].

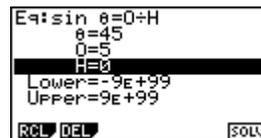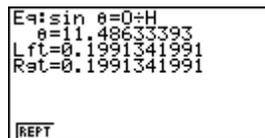| Eq:cos θ=A÷H **θ=0** A=5.4 H=8.9 Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:cos θ=A÷H θ=52.64573144 Lft=0.606741573 Rgt=0.606741573 [REPT]		Eq:cos θ=A÷H θ=55 A=6 **H=0** Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:cos θ=A÷H H=10.46068077 Lft=0.5735764364 Rgt=0.5735764364 [REPT]

Solve cos(Θº) = 5.4/8.9. Move the cursor to 'sit' over the target variable, Θ, and solve [**F6**].

Solve cos(55º) = 6/H. Move the cursor to 'sit' over the target variable, H, and solve [**F6**].

Eq:sin θ=O÷H **θ=0** O=4.6 H=23.1 Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:sin θ=O÷H θ=11.48633393 Lft=0.1991341991 Rgt=0.1991341991 [REPT]		Eq:sin θ=O÷H θ=45 O=5 **H=0** Lower=-9ᴇ+99 Upper=9ᴇ+99 **RCL DEL** [SOLV]	Eq:sin θ=O÷H H=7.071067812 Lft=0.7071067812 Rgt=0.7071067812 [REPT]
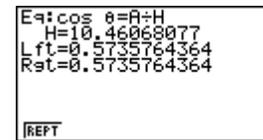
Solve sin(Θº) = 4.6/23.1. Move the cursor to 'sit' over the target variable, Θ, and solve [**F6**].

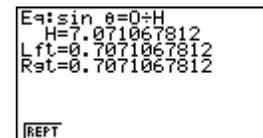Solve sin(45º) = 5/H. Move the cursor to 'sit' over the target variable, H, and solve [**F6**].

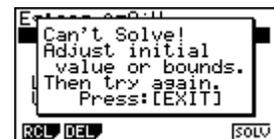Careful if you get this message! Recall that the inverse trigonometric functions have a restricted domain!

Can't Solve!
Adjust initial
value or bounds.
Then try again.
Press:[EXIT]
RCL DEL [SOLV]

A last word!

Well again, that's all I can fit onto the 4 pages! Enjoy term 3! 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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