Graphical Times.
Volume 10, Issue 38, 2011.

Welcome back to the start of term2! 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. Upcoming event is the NZAMT 12 conference in Dunedin 19th – 22nd July!

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 do areas equal each other?
- **Worksheets for the FX9750GII and similar models:**
  Finding turning points in the RUN-MAT icon.
  Solving Polynomial Equations with Complex Roots in the EQUA icon.
- **Term 2, 2011 pricing list.**

N.B. The 2011 Graphic Technologies Catalogue is available on request.
Please email us: 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.

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. 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.

Data projectors
These two NEW products, the XJA130 and XJA145 Casio projectors, added to our product range last year have been a 'hit'. If you are thinking of replacing current data projectors or looking for an additional unit(s) to meet your schools requirements please consider either of these two units. Additional information on these two data projectors is available on request.
Features Include
- Ecologically sound and energy saving
- NEW mercury-free light source
- 2 × optical zoom
- Lamp-free technology with up to 20,000 hours continuous performance
- USB 2.0 for PC-free presentations [XJA145]
- 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
- The size of a ream of A4 paper!

Data projector XJA130 **New product!**	$1750.00 + GST
Data projector XJA145 **New product!**	$2500.00 + GST

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

	→		→		→		→		→	
	→		→		→		→		→	

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).
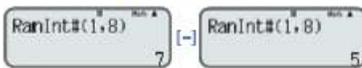
Graphic Technologies will be stocking this model when it arrives and launched in New Zealand at the NZAMT12 conference in Dunedin.

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

$14\pi \div 2\pi$

$\dfrac{10}{1+e^{2-0.463}}$
1.769718098

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

Random Integer Functions

RanInt#(1,8)   [=]   RanInt#(1,8)

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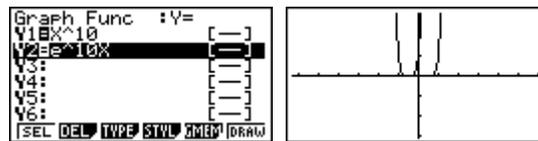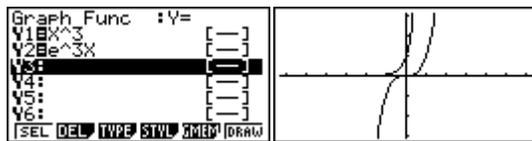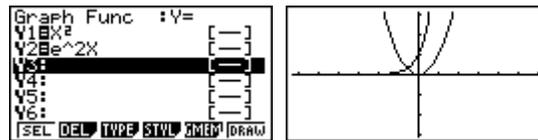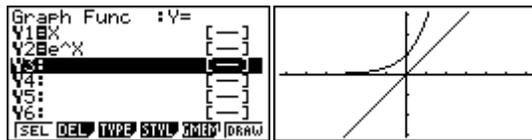Written specially to support New Zealand maths teachers in assisting students to learn all the capabilities of the fx-82AU PLUS, the all-new learning manual has simple mathematical tasks with concise how-to sequences, images and screenshots.

Includes **FREE** resources and ongoing Casio Education support

$\sqrt{12} \times \sqrt{6} \times \frac{\sqrt{3}}{2}$
7.348469228

Meets NCEA exam requirements

5 year 'replacement warranty'

A problem!

How many solutions are there to the equation $x^n = e^{nx}$? Can there just be no solutions, 1 solution, 2 solutions, 3 or more solutions?
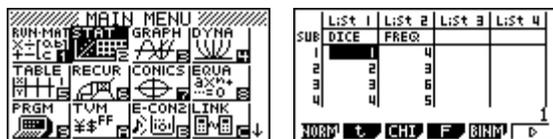
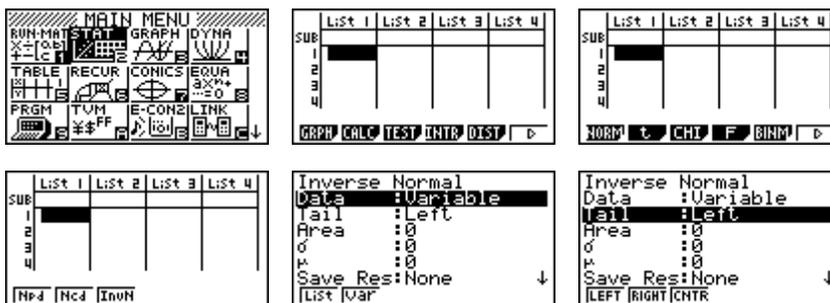All screen shopts have been done in the **View Window**:

```
View Window
Xmin  :-6.3
 max  :6.3
 scale:1
 dot  :0.1
Ymin  :-3.1
 max  :3.1
INIT TRIG STD STO RCL
```

```
Graph Func   :Y=
Y1=X
Y2=e^X
Y3:
Y4:
Y5:
Y6:
SEL DEL TYPE STYL GMEM DRAW
```

```
Graph Func   :Y=
Y1=X²
Y2=e^2X
Y3:
Y4:
Y5:
Y6:
SEL DEL TYPE STYL GMEM DRAW
```

```
Graph Func   :Y=
Y1=X^3
Y2=e^3X
Y3:
Y4:
Y5:
Y6:
SEL DEL TYPE STYL GMEM DRAW
```

```
Graph Func   :Y=
Y1=X^10
Y2=e^10X
Y3:
Y4:
Y5:
Y6:
SEL DEL TYPE STYL GMEM DRAW
```

Is there a pattern Consider $x^n = e^{nx}$, when n is an odd number and when n is an even number.

Some new features of the FX9750Gii explored.

1. Naming the columns in **STAT** mode.

```
MAIN MENU
RUN-MAT STAT GRAPH DYNA
...
TABLE RECUR CONICS EQUA
...
PRGM TVM E-CON2 LINK
```

```
     List 1 List 2 List 3 List 4
SUB  DICE  FREQ
1      1     4
2      2     3
3      3     6
4      4     5
NORM  t  CHI  F  BINM  ▷
```

2. Left, Central and Right selections for Inverse Normal calculations in **STAT** mode.

```
MAIN MENU
RUN-MAT STAT GRAPH DYNA
...
TABLE RECUR CONICS EQUA
...
PRGM TVM E-CON2 LINK
```

```
     List 1 List 2 List 3 List 4
SUB
1
2
3
4
GRPH CALC TEST INTR DIST  ▷
```

```
     List 1 List 2 List 3 List 4
SUB
1
2
3
4
NORM  t  CHI  F  BINM  ▷
```

```
     List 1 List 2 List 3 List 4
SUB
1
2
3
4
Npd Ncd InvN
```

```
Inverse Normal
Data    :Variable
Tail    :Left
Area    :0
σ       :0
μ       :0
Save Res:None        ↓
List Var
```

```
Inverse Normal
Data    :Variable
Tail    :Left
Area    :0
σ       :0
μ       :0
Save Res:None        ↓
LEFT RIGHT CNTR
```

a) Find the values of k such that $Prob(Z < k) = 0.45$ b) Find the values of k such that $Prob(-k < Z < k) = 0.45$

```
Inverse Normal          Inverse Normal
Data    :Variable       xInv=-0.1256613
Tail    :Left
Area    :0.45
σ       :1
μ       :0
Save Res:None        ↓
None LIST
```

```
Inverse Normal          Inverse Normal
Data    :Variable       x1Inv=-0.5977601
Tail    :Central        x2Inv=0.59776012
Area    :0.45
σ       :1
μ       :0
Save Res:None        ↓
None LIST
```

c) Find the values of k such that Prob(k < Z) = 0.45

d) A machine produces ball bearings with the weights of each normally distributed with a mean of 2700mg and a standard deviation of 12 mg. If 10 % of the ball bearings are rejected as being overweight for the mechanism they are to fit into, find the maximum acceptable weight to the nearest mg.

```
Inverse Normal          Inverse Normal
Data    :Variable       xInv=0.12566134
Tail    :Right
Area    :0.45
σ       :1
μ       :0
Save Res:None        ↓
None LIST
```

Require Prob(X > k) = 10% = 0.1, select **Right**, and enter **Area = 0.1**, **σ = 12** and **μ = 2700**.

```
Inverse Normal          Inverse Normal
Data    :Variable       xInv=2715.37862
Tail    :Right
Area    :0.1
σ       :12
μ       :2700
Save Res:None        ↓
None LIST
```
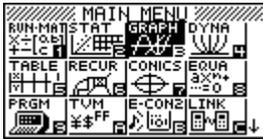
The maximum acceptable weight is 2715 mg (4 sig fig.).

3. x = y entry rather than just y = x in **GRAPH** mode

The **View window used is**:

```
View Window
Xmin  :-6.3
 max  :6.3
 scale:1
 dot  :0.1
Ymin  :-3.1
 max  :3.1
INIT TRIG STD STO RCL
```
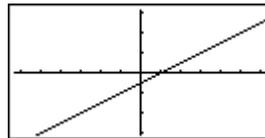
(a) x = 2y + 1

```
Graph Func   :X=
X1∎2Y+1          [—]
X2:             [—]
X3:             [—]
X4:             [—]
X5:             [—]
X6:             [—]
SEL DEL TYPE STYL GMEM DRAW
```
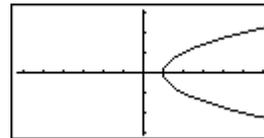
(b) x = y^2 + 1

```
Graph Func   :X=
X1∎Y²+1          [—]
X2:             [—]
X3:             [—]
X4:             [—]
X5:             [—]
X6:             [—]
SEL DEL TYPE STYL GMEM DRAW
```
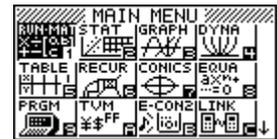
4. **Catalogue** – a list of mathematical symbols, commands to enter. Can be accessed through most of the **Main Menu** icons

```
Select Category
1:All
2:Calculation
3:Statistics
4:Graph
5:Program Command
6:Change Setup       ↓
EXE            EXIT
```

```
Select Category
1:All
2:Calculation
3:Statistics
4:Graph
5:Program Command
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EXE            EXIT
```

```
Select Category
1:All
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```

```
Select Category
1:All
2:Calculation
3:Statistics
4:Graph
5:Program Command
6:Change Setup       ↓
EXE            EXIT
```

```
Catalog
a(Reg)
[A]
a+bi
▶a+bi
aₙ
aᵢ
INPUT          CTGV
```

```
Calculation
▶a+bi
Abs
Arg
Augment(
C
Conjg
INPUT          CTGV
```

```
Statistics
a(Reg)
ABdf
Adf
Augment(
b(Reg)
Bar
INPUT          CTGV
```

```
Graph
BrokenThickG
Circle
ClrGraph
Cls
DotG
DrawGraph
INPUT          CTGV
```

```
Program Command
And
Break
CloseComport38k
ClrMat
ClrText
Do
INPUT          CTGV
```

```
Select Category
1:All
2:Calculation
3:Statistics
4:Graph
5:Program Command
6:Change Setup       ↓
EXE            EXIT
```

```
Select Category
6:Change Setup       ↑
7:Recursion
8:Dynamic Graph
9:Table
10:Equation
11:Financial(TVM)    ↓
EXE            EXIT
```

```
Select Category
6:Change Setup       ↑
7:Recursion
8:Dynamic Graph
9:Table
10:Equation
11:Financial(TVM)    ↓
EXE            EXIT
```

```
Select Category
6:Change Setup       ↑
7:Recursion
8:Dynamic Graph
9:Table
10:Equation
11:Financial(TVM)    ↓
EXE            EXIT
```

```
Select Category
6:Change Setup       ↑
7:Recursion
8:Dynamic Graph
9:Table
10:Equation
11:Financial(TVM)    ↓
EXE            EXIT
```

```
Change Setup
a+bi
ab/c
AxesOff
AxesOn
BG-None
BG-Pict
INPUT          CTGV
```

```
Recursion
aₙ
aᵢ
a₂
aₙ₊ᵢ
aₙ₊ᵢType
INPUT          CTGV
```

```
Dynamic Graph
D End
D Pitch
D SelOff
D SelOn
D Start
D Var
INPUT          CTGV
```
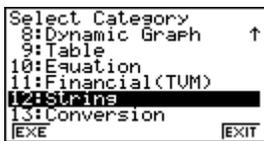
```
Table
BrokenThickG
DispF-Tbl
DotG
DrawFTG-Con
DrawFTG-Plt
F End
INPUT          CTGV
```

```
Equation
Ply Coef
Ply Result
Sim Coef
Sim Result
INPUT          CTGV
```

Websites of interest...

Watching the world go by!

http://www.worldometers.info/

Some probability interactive:

 http://www.mathsonline.co.uk/nonmembers/resource/prob/index.html

This census education resource came out in October 2010, and we hope has got to primary/intermediate/junior secondary resources. Do not forget it is Census year, Census day is set for Tuesday 8th March 2011.

http://www.stats.govt.nz/tools_and_services/services/schools_corner/census/2011-census-education-resource.aspx
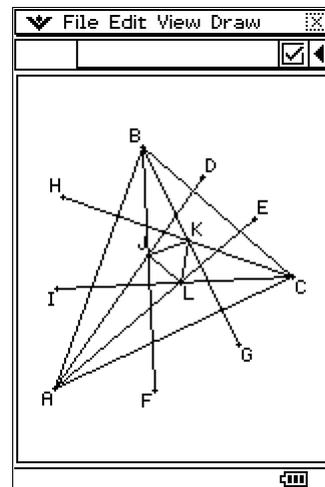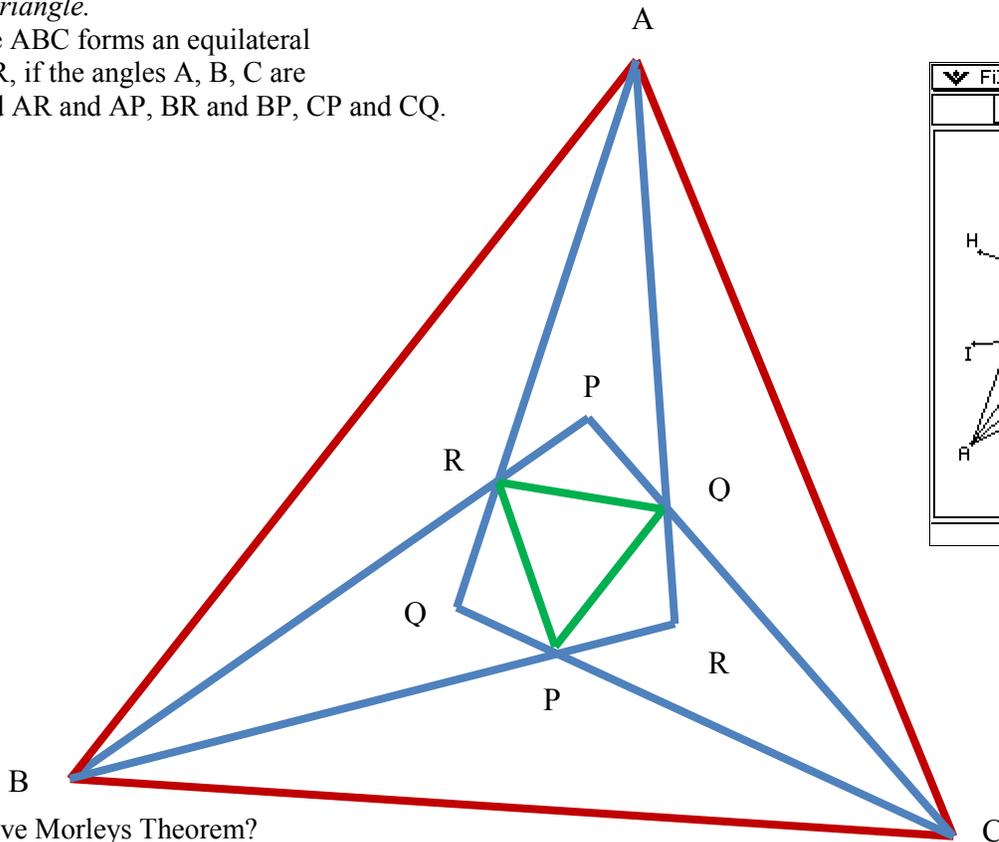
An excellent watch!

http://www.youtube.com/watch?v=jbkSRLYSojo

A geometrical problem to finish on!

Morleys Theorem: *The three points of intersection of the adjacent trisectors of the angles of any triangle form an equilateral triangle.*

Any triangle ABC forms an equilateral triangle PQR, if the angles A, B, C are trisected and AR and AP, BR and BP, CP and CQ.

Can you prove Morleys Theorem?

What do you notice about PP', QQ' AND RR'?

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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