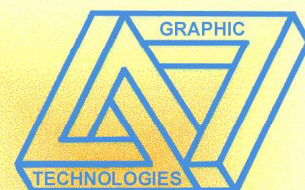


# Graphical Times.

## Volume 6, Issue 21, 2007



Welcome back to term 1! Not long to go, soon another academic year will have flown past! Yeah, right! Hope that you have had a restful Summer break and been able to read a few non-mathematical books. **Back to School deals for 2007 are with this mailout.** Hope you enjoy the read and all the best for your 2007 classes. There is a large number of weblinks for both the graphical and CAS calculator in this newsletter. Enjoy the term...

**Included in this newsletter are:**

**Graphic calculator activities – A look at the Achievement Standard 90643 Mathematics 3.3 2006 external paper.**

- **Worksheet: Graphic calculators – The Dam Busters.**  
– Laws of Exponents.
- **CAS – Simultaneous equations – 2 and 3 unknowns on the ClassPad 300.**  
– Basic Algebra on the ClassPad 300.
- **Term 1 pricing list.**
- **Back to School deals for 2007.**

### 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 ClassPad 300 +. A large number of schools took advantage of these either by combining with another school or singularly to look at how the graphic and CAS could impact on and to integrate this technology into your classroom practice.

### Classpad 300.

**Websites to bookmark:** CASIO educational website <http://world.casio.com/edu/> and <http://classpad.net/> What's new? Version 3 is out... from more information on what has been added, visit: [http://classpad.net/product/Classpad300/cp\\_manager\\_03.html](http://classpad.net/product/Classpad300/cp_manager_03.html) With the CAS Achievement Standards being registered in November 2006 the CAS Pilot Schools and any other school interested can assess via these two Achievement Standards. With this environment becoming common place in the Secondary schools system over the next few years should consider some teacher training and PD to assist in the transition to CAS. For more information visit:

<http://www.nzqa.govt.nz/ncea/assessment/search.do?query=mathe&view=achievements&level=01>

<b>90799</b>	<b>Demonstrate an understanding of straightforward algebraic methods</b>	<b>4 credits</b>	<b>External</b>
<b>90800</b>	<b>Demonstrate an understanding of the features of graphs</b>	<b>3 credits</b>	<b>External</b>

**N.B.** Students cannot use credit for both this achievement standard AS90147 and AS90148, towards a national qualification including a National Certificate of Educational Achievement.

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

	→		→		→		→		→
	→		→		→		→		→

## 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 are 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.

Please bookmark: [www.monacocorp.co.nz/casio](http://www.monacocorp.co.nz/casio)

## Websites of mathematical interest.

### Useful CAS Links:

<http://www.acdca.ac.at> Austrian Centre for Didactics of Computer Algebra

<http://www.edfac.unimelb.edu.au/DSME/CAS-CAT> University of Melbourne, Computer Algebra Systems in Schools-Curriculum, Assessment & Teaching Project

<http://b.kutzler.com> Bernhard Kutzler's Collection: Technology in Mathematics Education

<http://www.lonklab.ac.uk/came/> Computer Algebra in Mathematics Education, U.K.

<http://www.acdca.ac.at/t3/dergroup/index.htm> The Derive User Group and CAS-TI

<http://www.ed.psu.edu/casim/> Technology-Intensive Secondary School Mathematics Curriculum

<http://education.ti.com/us/resources/research/partc.html> Research with computer algebra systems (Texas Instruments), JOURNAL ARTICLES & BOOK CHAPTERS

<http://www.cas-time.com/>

CAS -TIME (Computer Algebra Systems - Technology In Mathematics Education)

<http://www.casioed.net.au/teachers/classpad/textbook.php> Download the pdf file on 'How do I ... on the ClassPad300'.

### Useful Graphical Links:

<http://www.charliewatson.com/casio/casold.html> and

<http://www.charliewatson.com/casio/casgames.html> These programs, and games are all in \*.cat format for easy download into your CFX model calculator via the Fa-122 cabling and free software.

<http://wwwstaff.murdoch.edu.au/~kissane/graphicscalcs.htm> Barry Kissane's weblink for assistance in using a graphic

<http://www.geocities.com/SiliconValley/1949/casio.html> A large number of programs for demonstrating mathematical concepts and ideas.

<http://www.citejournal.org/vol4/iss2/mathematics/article1.cfm> An article about the usefulness of the Algebra FX 2.0 built-in tutor feature.

<http://pegasus.cc.ucf.edu/%7Eucfcasio/ea100act.htm> Help in using the EA100 Data Logger.

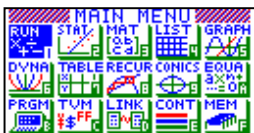
[http://www.casioed.net.au/services/tuition/fx9860/fx9860\\_tuition.php](http://www.casioed.net.au/services/tuition/fx9860/fx9860_tuition.php) Movies and material supporting the use of the FX9860G by Anthony Harradine and Alastair Lupton.

## Classroom Activities.

### Achievement Standard 90643 Mathematics 3.3 2006 external paper

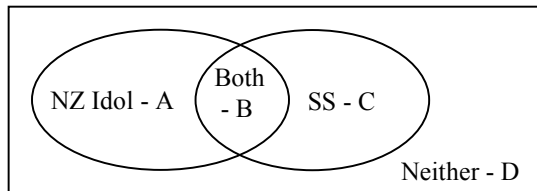
To be read in conjunction with the 2006 external paper.

**Solve straightforward problems involving probability.**



**Question 1**

Set up 4 simultaneous equations  
 $A+B+C+D=150$   
 $A+B=50$   
 $B+C=90$   
 $B=30$



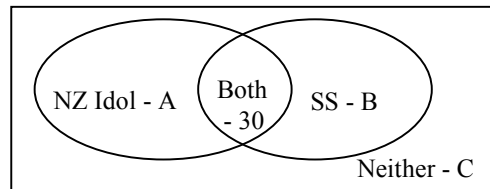
```
anX+bnY+CnZ+dnT=en
1 | 1 | 1 | 1 | 150
2 | 1 | 1 | 0 | 50
3 | 0 | 1 | 1 | 90
4 | 0 | 0 | 0 | 0
[SOLV DEL CLR]
```

```
anX+bnY+CnZ+dnT=en
1 | 1 | 1 | 1 | 150
2 | 1 | 1 | 0 | 50
3 | 0 | 1 | 1 | 90
4 | 0 | 0 | 0 | 30
[SOLV DEL CLR]
```

```
anX+bnY+CnZ+dnT=en
X | 20
Y | 30
Z | 60
T | 40
[REPT] 20
```

**OR**

Set up 3 simultaneous equations  
 $A + B + C = 120$   
 $A + 30 = 50$   
 $30 + B = 90$



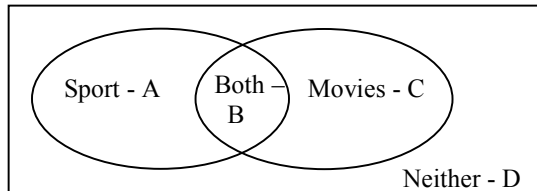
```
anX+bnY+CnZ=dn
1 | 1 | 1 | 1 | 120
2 | 1 | 0 | 0 | 20
3 | 0 | 1 | 1 | 60
[SOLV DEL CLR] 1
```

```
anX+bnY+CnZ=dn
X | 20
Y | 60
Z | 40
[REPT] 20
```

**Solution:** Neither watching =  $40/150$

**Question 2**

Set up 4 simultaneous equations  
 $A + B + C + D = 1$   
 $A + B + C = 4/5$   
 $B + C = 4/9$   
 $A + B = 2/3$



```
anX+bnY+CnZ+dnT=en
X | 0.3555
Y | 0.2111
Z | 0.1333
T | 0.2
[REPT] 14.45
```

```
anX+bnY+CnZ+dnT=en
1 | 1 | 1 | 1 | 1
2 | 1 | 1 | 0 | 0.8
3 | 0 | 1 | 1 | 0.4444
4 | 0 | 0 | 0 | 1
[SOLV DEL CLR]
```

```
anX+bnY+CnZ+dnT=en
1 | 1 | 1 | 1 | 1
2 | 1 | 1 | 0 | 0.8
3 | 0 | 1 | 1 | 0.4444
4 | 0 | 0 | 0 | 0.6666
[SOLV DEL CLR] 2.3
```

**OR**

Set up 3 simultaneous equations  
 $A + B + C = 0.8$   
 $B + C = 4/9$   
 $A + B = 2/3$

```
anX+bnY+CnZ=dn
1 | 1 | 1 | 1 | 0.8
2 | 0 | 1 | 1 | 0.4444
3 | 1 | 1 | 0 | 0.6666
[SOLV DEL CLR] 1
```

```
anX+bnY+CnZ=dn
X | 0.3555
Y | 0.2111
Z | 0.1333
[REPT] 14.45
```

**Solution:** Watching both =  $14/45$

**Question 3**

All possible HH, HT, TH, TT, therefore  $3/4$  of getting the required result for Stefan, similarly for Rewa therefore  $(3/4)^2 = 9/16$

```
(3.4)^2
9.16
```

**Question 4**

Stefan	1	2	3
Prob	$3/6$	$2/6$	$1/6$

```
List 1 List 2 List 3 List 4
1 | 0.5
2 | 0.3333
3 | 0.1666
[VAR EQAR REG] [SET]
```

```
I-Variable
X = 1.66666666
Σx = 1.66666666
Σx^2 = 3.33333333
xσn = 0.74535599
xσn-1 = 1
n = 1
[VAR EQAR REG] [SET]
```

Rewa	1	2	3
Prob	$2/6$	$1/6$	$3/6$

```
List 1 List 2 List 3 List 4
1 | 0.3333
2 | 0.1666
3 | 0.5
[VAR EQAR REG] [SET]
```

```
I-Variable
X = 2.16666666
Σx = 2.16666666
Σx^2 = 5.5
xσn = 0.89752746
xσn-1 = 1
n = 1
[VAR EQAR REG] [SET]
```

**OR**

		Stefan					
		1	1	1	2	2	3
Rewa	1	2	2	2	3	3	4
	1	2	2	2	3	3	4
	2	3	3	3	4	4	5
	3	4	4	4	5	5	6
	3	4	4	4	5	5	6
	3	4	4	4	5	5	6

Both	2	3	4	5	6
Prob	$\frac{6}{36}$	$\frac{7}{36}$	$\frac{13}{36}$	$\frac{7}{636}$	$\frac{3}{36}$

List 1	List 2	List 3	List 4
1	2	3	4
2	0.1666		
3	0.1944		
4	0.3611		
5	0.1944		
6	0.0833		

1-Variable	
$\bar{x}$	= 3.833333333
$\sigma_x$	= 3.833333333
$\sigma_{x^2}$	= 16.85555555
$\sigma_{\ln}$	= 1.166666666
$n$	= 1

**Solution:** Expected value =  $1 \frac{2}{3} + 2 \frac{1}{6} = 3 \frac{5}{6}$

### Question 5

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

.225 ÷ .3	0.75
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**Solution:** 0.75

### Question 6

$$\begin{aligned} \text{Prob} &= {}^8P_8 \div {}^{10}P_{10} \\ &= 8! \div 10! = \frac{1}{90} \end{aligned}$$

**Solution:**  $\frac{1}{90} = 0.011111\dots$

$8P8 \div 10P10$	0.0111111111
------------------	--------------

### Question 7

Not able to be done on the graphical calculator.

## Technology in the mathematics classroom.

Providing a richer, mathematical experience for secondary school students.

**“Computers and graphic calculators should be to mathematics teachers as what laboratory equipment is to science teachers.”**  
(Demana & Waits, 1990, pp 29.)

Discussions about the use, role and impact of technology in secondary schools have, and will continue to be a topical issue in this present climate of educational reform. Technology, and in particular, a student's own personal technology, needs to be assessable and relevant to the needs of the students and should support and encourage their mathematical learning. Computer and calculator use are becoming a specialist tool for secondary school mathematics (and science students), soon developments in graphical calculator functions will see them looking and behaving like a computer, **and that merge has arrived!** The most talked about features of hand-held CAS is the ability to symbolically manipulate, however the CAS calculators available on today's market go beyond that. There is a 'seamless' connection between mathematical strands (e.g. Algebra – Geometry) via a CAS calculator assisting students in making real connections between mathematical concepts, rather than viewing mathematics as isolated islands of ideas. **The ClassPad 300 is this very tool. Get yours NOW! See the flyer attached to this mailout.**

## A last word!

Well again, that's all I can fit onto the usual 4 pages! Have a great term 1! Hope to see you at a workshop 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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