

Graphical Times.

Volume 18, Issue 66, 2018.



Welcome back to term 2, 2018! Interestingly it has been a while that there has been exactly four 10 week terms in a year, but dependent on your local school dates! Patterns are the 'bread and butter' to algebra. NZC (2007) maps its progression clearly. The Learning Progressions Framework assists with curriculum levels (CL) 1-5 (Originally was CL 1-4).

This term we have some items on special this term and a promotion for a Digital camera and Calculator Carry Bag (See page 2). All the best for another busy 10 week school term!

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:** **Binomial Distribution**
- **Worksheet for the FX9750GII and similar models:** **Primes and Programming**
- **Worksheet for the FX82AU+II and similar models:** **Patterning**
- **Term 2, 2018 pricing.**

Workshop opportunities

Workshop opportunities: If you would like to have a workshop for teachers and or students then please 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 acknowledging that Year 11, 12 & 13 students without the use of a graphical calculator are being disadvantaged. A large number of schools have taking the opportunity to upskill teachers and students in using these mathematics/statistics hand-held and emulator classroom technologies.



Worksheets downloaded off the web

Visit Monaco Corporation and Graphic Technologies websites to view and download worksheets and activities or past newsletters. There are links to other mathematics education websites too! For teachers we currently offer a large number of 'classroom ready' resources available and are designed primarily for the FX82AU, FX82AU+II, FX9750GII, FX9750G, FX9750G+, CFX9850GB, CFX9850GB+, CFX9850GC+, FX9750GA, FX9750GA+ and FX9750GII and the ClassPad300, 300+, 330A, 330A+ and the fx-CP400 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>

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

A reminder of the Casio Education NZ Top Schools Program which supports schools using the FX82AU+II and FX9750GII calculators. The goal for 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 are offered in conjunction with Graphic Technologies in supporting this initiative. Register now for 2018, if you have not already done so. Further details of the program can be uploaded from: www.casio.edu.monacocorp.co.nz

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

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Classpad updates

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 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, activities and worksheets. These can be downloaded and sent to the handheld model using the USB cable (SB-67). Programs can be written and downloaded to extend the functionality of the ClassPad II. eActivities, files and programmes can also be transferred from calculator to calculator using the SB-62 cable. **Online User manuals:** <http://support.casio.com/manualfile.php?rgn=5&cid=004002012>
 Visit: <http://www.classpad.com.au/index.html>

Graphic Technologies Special Pricing for Term 2, 2018

Some pricing specials, valid until 20th July, 2018.

Product	Price per unit (excl GST)
FX991ES plus emulator software single licence Only 1 left Special*	\$50.00
FA9860B emulator software school licence [FX9750GII] Only 1 left Special*	\$600.00
FX82A+II emulator software single licence Only 1 left Special*	\$50.00
ClassPad330 individual user PC licence Only 1 left Special*	\$170.00
AAA Batteries Card of 4 (Minimum 12 cards (48) an order) Special price for term 2	\$5.00
AA Batteries Card of 4 (Minimum 12 cards (48) an order) Special price for term 2	\$5.00
Back up battery CR2032 [for graphic calculator] Special price for term 2	\$1.50
Buy in multiples of 10 FX9750Gii and receive one free FA-124 USB cable Special price for term 2	\$950.00
*Note: Emulator software, for 1 or 3 year licences, can now be purchased from: https://secure.shareit.com/shareit/product.html?productid=300741994&sessionid=3059850727&random=f13dec3ae98d31c1ace29114bff7b234	See this website for more details.

Terms 2 & 3 - Casio Carry Bag & Exilim Digital Camera Promotion

The winning school is [YOUR SCHOOL NAME COULD BE HERE] will be receiving this randomly drawn prize in November, 2018. A CASIO Carry Bag and Exilim Camera.

To go into the draw, schools need to purchase products totalling \$200 (excl GST) or more over the next 2 terms.

NOTE: Multiple purchases = Multiple entries.



Why Algebra Matters?

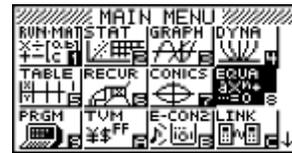
Algebra is an abstract concept in mathematics. Even if you do not think you will ever need algebra outside of school, managing budgets, paying bills, and even determining health care costs and planning for future investments or designing your first house requires a basic understanding of algebra. Along with developing critical thinking, specifically logic,

patterns, problem-solving, deductive and inductive reasoning, understanding the basic concepts of algebra can help you to handle to solve complex problems.

FX9750ii

EQUATION SOLVER.

Select **EQUA** mode from the main menu by using the arrow keys to highlight the **EQUA** icon or by pressing 8.



Note: To type letters press the [ALPHA] key then the key with the appropriate red letter on top of it. The equals sign is accessed by pressing [SHIFT] [=].

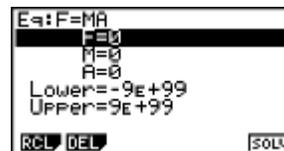
Enter into **SOLVe** by pressing [F3].



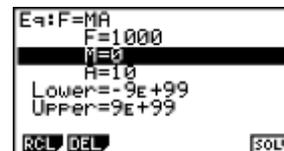
You are 'greeted' with the screen shown above. This is where you can enter the equation you are working with and solve the equation with the information about the 'known' variable(s) and solve for the 'unknown' variable.

Example 1: Using **Force = Mass × Acceleration** i.e. $F = MA$, find the value of the mass of the object, if the Force = 1000 Newtons and the acceleration = 10 ms^{-2} .

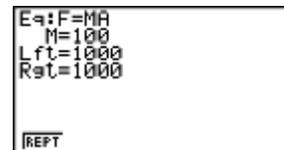
Answer: Given that $F = MA$ and $F=1000$, $A=10$ find M . Type in the equation $F = MA$, then press [EXE] to store. Set all of the variables to 0.



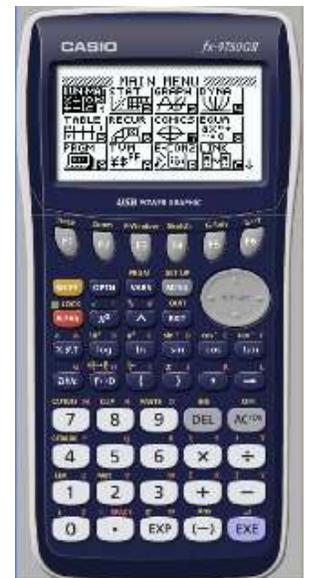
Then change the known variables to those that are defined in the problem.



Now, move the 'cursor' so that it is 'sitting' over the top of the variable that you want to calculate the answer to, in this case 'M'.

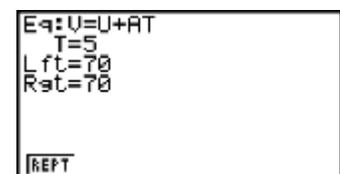


Now, **SOLVe**, [F6].



Example 2: Given that $V = U + AT$ and $U = 20 \text{ ms}^{-1}$, $V = 70 \text{ ms}^{-1}$ and $A = 10 \text{ ms}^{-2}$, find T .

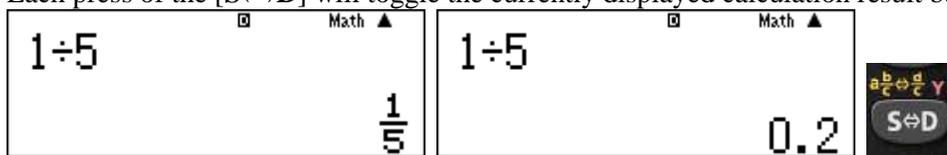
Answer: Type in the equation $V = U + AT$. Enter the appropriate value for each variable as shown in example 1, highlight **T = 0** and press **SOLVe** [F6].



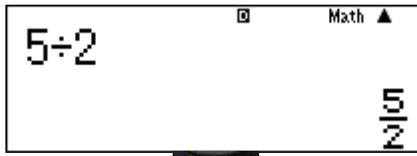
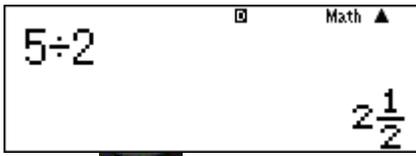
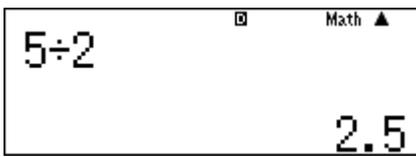
FX82AU+ii

Toggle calculation results from line output, to decimal to natural display format.

Each press of the [S<=>D] will toggle the currently displayed calculation result between its decimal and fraction form.



Using [SHIFT] [S<=>D] will toggle between a mixed number (a^b/c) and its improper fraction (d/c) equivalent.



[SHIFT]



Note: With Natural Display (**MathO**), pressing [SHIFT] [=] instead of [=] after inputting a calculation will display the result in decimal form.

Patterns

• Odd numbers

Sequence of terms	Sum =	Number of terms =	Median of numbers =
1	1	1	1
1 + 3	4	2	2
1 + 3 + 5	9	3	3
1 + 3 + 5 + 7	16	4	4

What is the connection?

$$1 + 3 + 5 + \dots + (2n + 1) = n^2$$

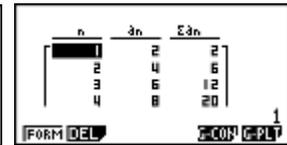
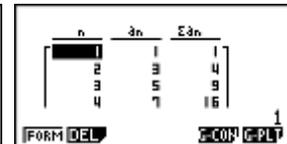
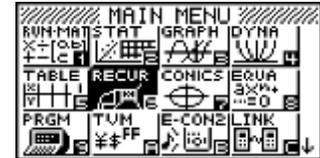
• Even numbers

Sequence of terms	Sum =	Number of terms =	Median of numbers =
2	2	1	2
2 + 4	6	2	3
2 + 4 + 6	12	3	4
2 + 4 + 6 + 8	20	4	5

What is the connection?

$$(1 + 1) + (3 + 1) + (5 + 1) + \dots + (2n + 1 + 1) = n^2 + n$$

What is the connection between the **Odd numbers** pattern and the **Even numbers** pattern?



Websites

- Numberphile $n^a - m^b = 1$: <https://m.youtube.com/watch?v=d-o3eB9sfls>
- The Brilliant website for daily problems set at 3 different levels: <https://brilliant.org/> e.g. <https://brilliant.org/weekly-problems/2017-03-13/basic/?p=1>
- MATHTREK <https://www.sciencenews.org/search?st=mathtrek> gives you access to over 100 articles on a variety of mathematics topics.

A last word!

Well again, that's all I can fit onto the 4 pages! Enjoy term 2! Hope to see you at some workshops or hear from you! 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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